# Economic Impact and Use Survey of South Carolina Artificial Reef Users: Private Boat Anglers and Charter Divers, 2006

Report Prepared for the South Carolina Department of Natural Resources, Marine Resources Division

**By**

Raymond J. Rhodes
Department of Economics & Finance
and
Dr. Bing Pan
Department of Hospitality &Tourism Management
School of Business & Economics
College of Charleston
66 George Street, SC 29424

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**The views expressed herein are those of the authors and do not necessarily reflect those of their employers or the funding entities.**

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## EXECUTIVE SUMMARY

The Marine Resources Division of the South Carolina Department of Natural Resources (SCDNR) developed and currently manages a system of 45 marine artificial reef (**AR**) areas or sites off the South Carolina (SC) coast and within SC estuarine (internal) waters (Fig. 1). This vast array or system of artificial reef sites enhances saltwater recreational fishing and diving opportunities while directly mitigating heavy utilization impacts on limited natural hard-bottom area of SC. Although the SCDNR has been responsive to AR user needs, the last comprehensive fishery AR usage-oriented survey was completed more than 13 years ago and is considered outdated because the number and diversity of AR sites has substantially changed, as well as the apparent harvesting capabilities of recreational anglers. Consequently, the purpose of this research was to systematically collect updated information (2006) on AR recreational users (i.e. recreational anglers and charter divers) with an emphasis on estimating management oriented aggregates such as total monthly AR related fishing trips completed by private boat recreational anglers and the economic impacts (e.g. sales, jobs, sales taxes, etc.) on the SC coastal economy associated with the AR system. The results of this research are also expected to provide SCDNR with new insight for enhancing the current and future management of this system, while informing the general public of economic impacts stemming from this diverse array of AR sites managed by the SCDNR.

Angler oriented information on AR related private boat fishing trips during 2006 was collected by random monthly sampling of ~19,200 SC saltwater license holders using mail questionnaires and an equivalent Internet survey instrument from May through November 2006. Information collected from responding licensees that had fished at AR sites included the number of AR related fishing trips during a given recall month, species caught and expenditures associated with their most recent AR fishing trip. Recreational diving information related to AR sites was collected by periodic phone survey of the five SC coastal scuba diving charter businesses offering SC oceanic charter dive trips, conducting a comprehensive census of all oceanic dive trips completed by these businesses and sampling of their dive charter customers during 2006.

Over 6,207 usable mail questionnaires and Internet responses were received from licensees during the 2006 sampling, and the response rate adjusted for undeliverable mail was 35%. In general, 90% of the responding licensees reported recreational saltwater fishing in or off of SC during the last two years with about 85% of the licensees reporting one or more SC saltwater fishing trips using private boats during the past twelve (12) months. In addition, 32% of these active SC saltwater private boat anglers also reported completing one or more trips involving AR sites with SC coastal county licensees having the highest percentage, 34%, of these AR trips. In contrast to these 12-month response percentages, monthly responses indicated that the percentage of licensees completing one or more SC saltwater fishing trips during a given sampled month were about 13% and 11% for SC coastal and SC non-coastal county licensees, respectively, and ~11% for non-residents that were sampled during a four-month period (i.e. May-August, 2006). These monthly and annual (12-month) percentages of sampled licensees making AR trips are consistent with AR sites being among several general fishing areas available for active saltwater anglers.

The 45 SC marine permitted AR areas were grouped into three north to south oriented AR permitted area “clusters”, i.e. “North Cluster,” “Central Cluster” and the “South Cluster.” An analysis of AR trips within license regions indicated that the highest percentage of fishing on AR permitted areas within the SC coastal county licensees occurred in the North and Central Clusters. In addition, within non-resident licenses, the North Cluster of AR sites had the highest percentage of AR trips. These percentages are consistent with the high percentages licensees residing in the SC coastal counties of Berkeley, Charleston, Dorchester, Georgetown and Horry, as well as a high

percentage of North Carolina (non-resident) licensees apparently choosing to fish on AR sites in the North Cluster. Reponses also indicated that approximately 54% of the active AR anglers would make fewer saltwater fishing trips if AR sites were not available, and a regional comparison indicates that this percentage would approach 60% or higher for SC non-coastal AR anglers that fish on AR sites within the Central and South Clusters.

Estimates of total (aggregate) SC private boat fishing trips involving SC permitted marine artificial reef sites by SC licensees during 2006 were extrapolated based on the percentage of respondents who fished on one or more AR sites during a given recall month and the total Fiscal Year 2005-2006 license sales by the three license regions. Major assumptions were also made when estimating total monthly AR trips during months not sampled in 2006 including the conservative assumption that AR related fishing trips during January and February 2006 were not significant. The projected total number SC private boat saltwater fishing trips involving permitted marine AR areas in 2006 was estimated to be **~203,400 trips** and these estimated AR trips were about 49% of all 2006 ocean SC fishing trips estimated by a federal survey. A comparison between the 1992 and the 2006 estimates of annual total AR trips indicates that saltwater fishing trips involving AR sites approximately tripled between 1992 and 2006 while the number of permitted AR areas has only doubled since 1992. Based on primary data collected on charter divers, a total of 3,571 divers participated in charted SC offshore dive trips during 2006 with 53% of these charter divers (1,902 divers) making one or more dives on structures within SC permitted artificial reef sites.

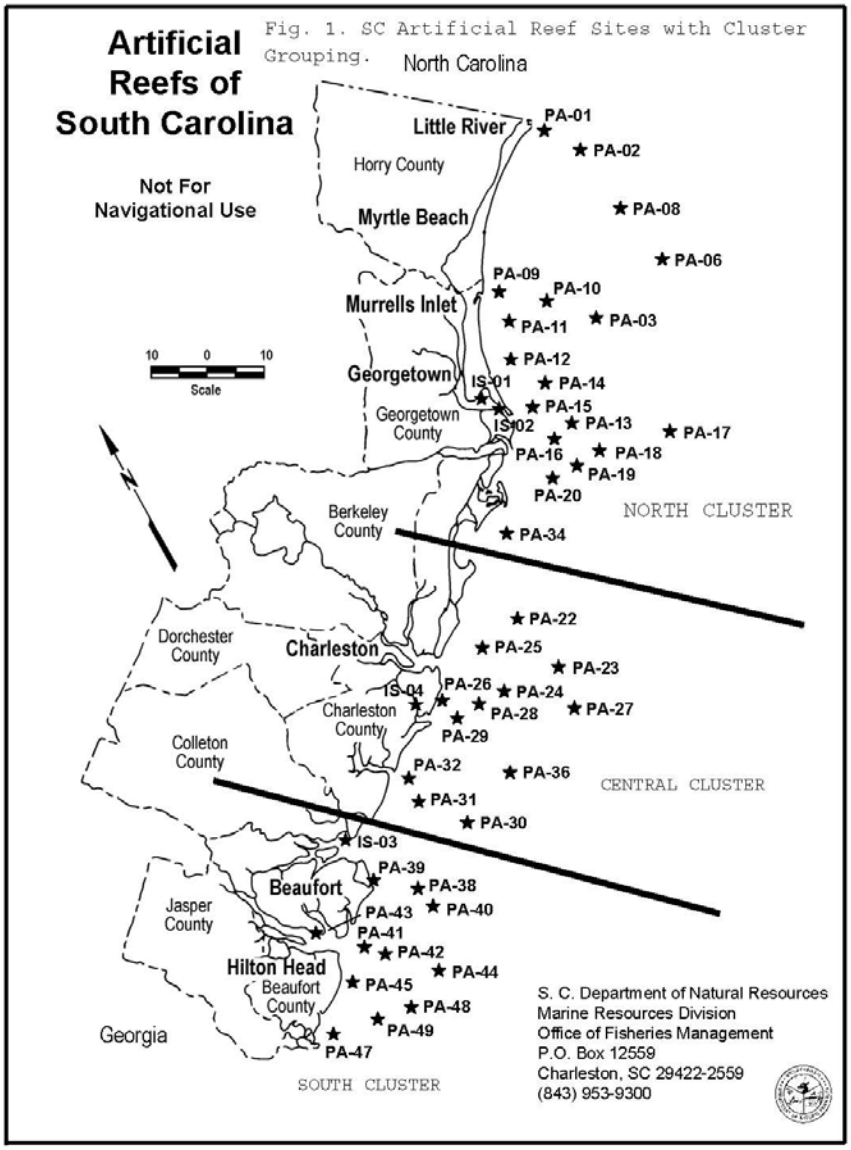
The estimating of economic impacts and economic importance of anglers and charter divers related to the use of SC permitted marine artificial reef sites was predicated upon estimating total (aggregate) annual trip expenditures for each user group (i.e. anglers and charter divers) using their daily trip expenditure averages (means) by major license regions and overnight trips in the SC coastal counties. The mean total daily trip expenditures by private boat anglers making an AR related fishing trip during a sampled month ranged from $548 for non-coastal anglers staying overnight to about $255 for SC coastal anglers not making overnight trips, and the total mean daily expenditures by non-coastal charter divers staying overnight were $381. The estimated total (aggregate) trip expenditures by private boat anglers and charter divers making trips involving AR sites were $28.7 million and $0.6 million, respectively, during 2006. These AR users in 2006 represented an economic impact (i.e. economic importance) of approximately **$83 million** in total sales (output) that generated approximately 1,000 jobs. It is readily apparent that the SC marine artificial reef system, as developed and managed by the SCDNR, is clearly a significant component of the entire SC coastal economy. In addition, the man-made structures within SC permitted artificial reef areas, as recreational outdoor “destinations,” are an important component of the economic impacts generated by a special group or subset of tourists, i.e. anglers and scuba divers.

This report includes recommendations oriented to the socioeconomic aspects of artificial reef usage, evaluation and related management issues. These recommendations include conducting surveys of AR users at least every 5 to 7 years, incorporating tradeoff analysis approaches such as stated preference choice models when surveying AR users regarding their preferences and, if appropriate relative to fishery sustainability concerns, tourism stakeholders should consider the feasibility of “off-season” promotions targeting the AR tourist angler market segments.

## INTRODUCTION

According to Seaman and Jensen (2000), "An *artificial reef* is one or more objects of natural or human origin deployed purposefully on the seafloor to influence the physical, biological, or socioeconomic processes related to living marine resources." The system of 45 marine artificial reef areas off of the SC coast and within SC estuarine (internal) waters (Fig. 1) managed by the Marine Resources Division of the SCDNR is definitely congruent with the above Seaman and Jensen (2000) multi-use oriented definition of artificial reefs. Specifically, the SCDNR expansive system of marine artificial reef sites enhances saltwater recreational fishing and diving opportunities, mitigates heavy utilization impacts (i.e. consumptive and non-consumptive use) on the limited natural hard-bottom areas[1] off of SC (SCDNR n.d.), while providing a diverse assortment of inshore and offshore artificial reef (AR) sites accessible by private boater anglers from major SC inlets, sounds (e.g. Port Royal Sound) and other major waterways (e.g. Charleston Harbor) along the SC coast.

**Fig. 1. SC Artificial Reef Permitted Areas with Groupings of Areas into Clusters**




[1] Off SC much of the continental shelf is covered with several feet of sand, while only 5% to 10% of this shelf area apparently has the appropriate geological composition to facilitate natural reef formation.

Although the SCDNR has been responsive to AR user needs, the last comprehensive fishery management usage-oriented AR user survey was completed more than 13 years ago (Rhodes *et al.* 1993) and is considered outdated because the number of AR sites has doubled from 24 in 1992 to 45 sites (2006) and the total number of SC saltwater anglers has apparently increased more than 70% between 1992 and 2005[2], while the affordability and availability of advanced fishing technology (e.g. GPS based electronics) has apparently expanded the overall harvesting capabilities of recreational anglers. Moreover, the federally sponsored survey, the Marine Recreational Fisheries Statistics Survey (MRFSS), that is used to estimate SC recreational fishing saltwater catch and effort statistics does not routinely collect data specific to SC saltwater fishing trips involving permitted AR areas. Consequently, the purpose of this survey research was to obtain updated information (2006) on AR recreational users (i.e. private boat anglers and charter scuba divers) regarding their use patterns (e.g. number of monthly AR related fishing trips, etc.) and other information (e.g. selected demographics of these users) including AR related trip expenditures. Along with characterizing AR use patterns, primary and secondary (e.g. SCDNR license sales) data collected during this research were also used to estimate and extrapolate management-oriented aggregates such as total monthly AR related fishing trips completed by private boat recreational anglers during 2006 and the economic impacts (e.g. sales, jobs, sales taxes, etc.) of the SC marine artificial reef system on the SC coastal economy. The results of this research are also expected to provide SCDNR with new insight for enhancing the current and future management of this system as well as informing the general public of economic impacts stemming from this diverse array of AR sites.

## METHODS

### SC Saltwater Recreational Fishing License Data and Address Regions

The primary data collected in this study relating to fishing within permitted areas of the AR system during 2006 was based on the random sampling of the Fiscal Year 2005-06 (FY06) and Fiscal Year 2006-07[3] (FY07) computerized records[4] of SC saltwater recreational licensees as compiled by the SC Department of Natural Resources (SCDNR). Recreational anglers using a private boat (i.e. not permitted as "for-hire" boats) for saltwater fishing in SC waters are required to purchase a SC Saltwater Recreational Fishing License from the SCDNR. There are four types of licenses sold: annual (12-month) resident licenses, annual non-resident licenses, 14-day resident licenses and 14-day non-resident licenses. Data collected from a SC license purchaser include a mailing address, gender, race, and date of birth. SCDNR sold a total of 118,669 SC saltwater recreational fishing licenses during FY06. Based upon the aggregates reported by SCDNR, annual resident licenses comprised 72% of the total sold in FY06, followed by 14-day nonresident licenses, 16%. Due to travel cost considerations and data needed for estimating economic impacts, usable license records were categorized into three regions based on licensee mailing addresses (Fig. 2): the SC coastal (**SCC**) Region, a 17-county region in eastern SC; the SC non-coastal (**SCNC**) Region, 29-county region generally in western SC Region (i.e. all other licensees with SC addresses not in the SCC Region); and a Non-South Carolina (**NSC**) Region, mainly comprised of licensees with North Carolina and Georgia addresses. These Regions are also generally congruent with the license types because licensees in the SCC Region and SCNC Region purchased 93% and 88% of the annual resident licenses, respectively, while individuals in the NSC Region purchased 71% of the 14-day non-resident

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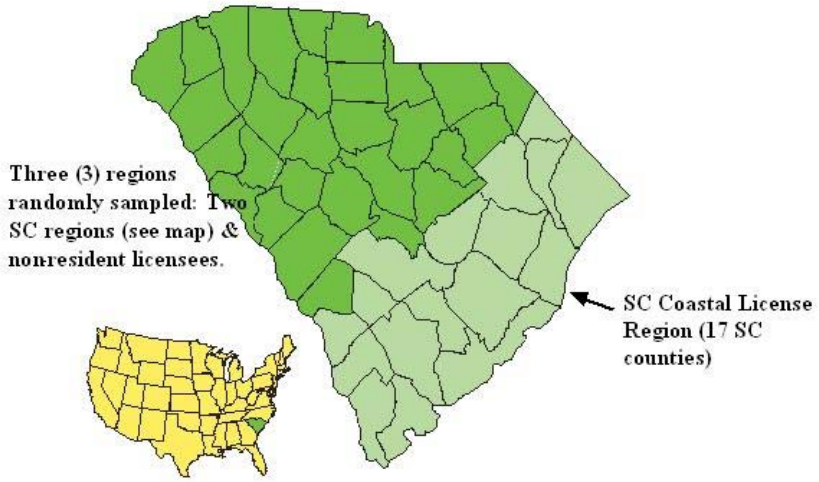
[2]Marine Recreational Fisheries Statistic Survey (MRFSS) estimated that the annual number of SC saltwater fishing participants increased from about 479,400 in 1992 to 831,300 by 2005, a 73% increase (Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD).

[3]Specifically, the SCDNR FY license cycles were July 1, 2005 to June 30, 2006, and July 1, 2006 to June 30, 2007, respectively. It should also be noted that anglers are allowed to purchase a license for a forthcoming license Fiscal Year starting in May. For example, a FY07 license could have been purchased in May 2006.

[4]Most, 99.6%, of the FY06 licenses sold were manually entered or electronically compiled via on-line sources in the SCDNR license database, a total of 118,242 records. In contrast, 4,563 records, ~4% of all FY06 electronic records were not considered usable for survey purposes. Unusable database records included records with incomplete address data and/or records missing variable data except for the license number and type data.

licenses during FY06. For all FY06 licenses sold, 56% were by purchased by individuals with mailing addresses in the SCC Region, followed by purchasers in the NSC Region, 24%, and about 20% by SCNC Region licensees.

**Fig 2. Sampled (2006) South Carolina Regions Based on the Mailing Addresses of the SC Licensees.**




**Licensee Sampling Procedure**

The sampling framework involved randomly selecting a fixed number of licensees, about 1,260 licensees within each Region, every month starting in May 2006. This fixed sample size of ~1,260 licensees per Region and month was based upon pre-test results and professional judgment that a minimum target sample of 30 respondents completing one or more trips involving fishing within AR areas during a given recall month would be needed for statistical purposes. It was assumed that at least 24% of the sampled licensees in a Region would respond and ~10% of these responding licensees would have fished within an AR permitted area during a given recall month (i.e. 30 AR Responses/24%/10% =1250 Sample Mailings Per Region).

The FYO6 sampled license data included licenses purchased as early as May 2005. Monthly mail sampling of FY06 license holders started in May 2006 using computerized license records entered by the SCDNR through April 10, 2006, but before the end of the SCDNR FY06 license year, June 30, 2006. Regardless, most (90%) of all FY06 licenses sold and usable for survey purposes were available for monthly sample mailings starting in May 2006. Once the licensee mail survey was implemented, it became apparent that undeliverable rates for monthly samples drawn from FY06 license records, although not considered substantial (e.g. average ~7%), were still problematic. Moreover, it was judged that using FYO7 computerized license records would significantly decrease the undeliverable rate partially because the FY07 records would include some individuals purchasing licenses as early as May 2006. Therefore, it was decided to stop using FY06 licensee records for sample mailings after the August 2006 mailings and begin random sample mailings to individuals purchasing licenses during FY07, starting with mailings in September 2006 (the August 2006 recall month sampling). The computerized populations of FY07 license records used for sample mailings were also updated during September and October 2006 between monthly mailings with new license purchases before samples randomly generated for the October and November were mailed.

The random mail sampling (without replacement[5]), 1,260 of FY06 licensees in May 2006, with April as the respondent's recall month, was only comprised of SCC Region licensees **(Table A1)**[6] due to budget constraints. After the May mailings, licensees in all three license Regions were sampled during the June, July, August and September 2006 mailings. As previously noted, only FY07 licensees were sampled during the September, October and November 2006 mailings per fishing activities during the recall months of August, September and October, respectively. FY07 licensees in the NSC Region were not sampled during the October and November mailings, and mail sample sizes were reduced to 770 and 713 licensees for the SCC Region and SCNC Region licensees, respectively, for these mailings due to budget constraints. The aggregate (total) of sample mailings represented a substantial percentage (e.g. >5%) of all usable FY06 license records by Region, ranging from 19% of NSC Region licensees to 8% of SCC Region licensees.

**Sampling Instruments and Modes for Licensees**

The random monthly mailings were generally used to collect primary data from sampled licensees regarding fishing activities during 2006 including the number of trips involving permitted SC marine artificial reef (AR) areas, fishing trip related expenditures (e.g. fuel expenses) as well as selected socioeconomic data (e.g. licensee's years of fishing experience). Pre-testing of mail questionnaires during 2005 and early 2006 indicated that these data could be collected by mailing each selected licensee a self-administered, "paper-pencil" mail questionnaire (See Appendix 1.1) with a cover letter. Pre-testing also indicated that this cover letter could also be effectively used to inform the licensee that he had the option of responding using either the enclosed mail questionnaire or an equivalent Internet based questionnaire. In order to mitigate possible recall concerns, both survey instruments contained selected questions requiring the respondent to only recall fishing related activities in the month (i.e. the recall month) immediately preceding the mailing month (See Appendix 1.1, Mail Questionnaire, Questions B1, B2, B3 and B4). For example, sampled FY06 licensees mailed questionnaires in July 2006 were asked to recall if they went saltwater fishing in and/off of SC during June 2006, the recall month on each questionnaire mailed during July 2006. In addition, first mailings to sampled licensees were usually completed within ten days of the month immediately following a given recall month, and second mailings to licensees were usually completed within 14 days of the first mailing. Moreover, if a respondent completed one or more fishing trips involving an SC AR area in a given recall month, he was asked to only recall trip details related to the most recent AR related trip including trip expenditures (See Appendix 1.1, Mail Questionnaire, Question C10) and the two most abundant species caught while fishing on or near SC AR area(s) during the trip.

Sampled licensees were also informed in the cover letter that their mail questionnaire included a unique ID stamped in the upper right corner of the each questionnaire. This ID served two purposes: it assisted SCDNR with reducing second mailings to licensees responding to the first mailing for a given month via the mail or Internet mode; and it provided a unique ID number for identifying licensees choosing to respond using the Internet mode.

**Collecting Charter Diving Data**

Since SC coastal dive shops (businesses) sponsoring offshore diving trips include dives on AR sites, sampling of charter divers and a census of all SC oceanic ("offshore)[7] diving trips sponsored by SC coastal dive shops was conducted during 2006. After pre-testing sampling protocols and related instruments in 2005, the random collection of data from individual charter divers started in July and was completed in early October 2006. Charter divers were sampled by intercepting them just before they departed on their oceanic dive trip. These intercepted divers were asked to fill out a self-administered, paper-pencil questionnaire card that included questions regarding the anticipated dive sites, general purpose of the dive

[5] Random sampling without replacement was attempted within a given Fiscal Year in order to avoid sample mailings to a licensee more than once using a given Fiscal Year data set, i.e. a selected (sampled) licensee's record was not returned to the record population to be sampled for future mailings.

[6] All tables with the capital letter "A" preceding the table number can be found in the Appendix 2.

[7] Some of the SC coastal dive shops sponsor river (e.g. Cooper River) diving trips, but data related to these river trips were not collected during this dive shop census.

trip (e.g. recreational, dive training, etc.) and estimates of daily expenses associated with the dive charter trip (See Appendix 1.2). The 2006 census of SC offshore diving trips sponsored by SC coastal dive shops involved weekly phone calls to SC dive shop owners and/or managers sponsoring charter oceanic diving trips off SC. In addition, during January and February 2007, daily charter notes were collected from these SC coastal dive shops regarding all of their offshore dive trips during 2006. For each dive trip date, these dive shop notes included summary information on the number of active divers participating in the dive trip and the general dive sites including sites within permitted AR area. Due to the proprietary nature of the data collected from individual SC dive shops and their intercepted charter customers (divers), and the small number of shops, i.e. five shops, all data collected from divers and dive shops was aggregated at the SC coastal region level and was not reported (summarized) at an individual SC county level.

**Estimating Total Marine Artificial Reef Related Fishing Trips, 2006**

Estimates of total SC private boat fishing trips involving SC permitted marine artificial reef sites by SC licensees during 2006 were generated based on a simple extrapolation of using the monthly rate (percentage) of fishing trips involving AR sites and the total FY06 license sales by three major licensee mail regions. Specifically, for each of the three license regions, the estimated annual total number of SC private boat trips involving AR sites was extrapolated by summing the number of estimated number of AR related fishing trips for each month within a given license region.

**Estimating the Economic Impacts of the SC Marine Artificial Reef System**

The trip expenditure patterns of SC saltwater recreational licensees completing fishing trips involving AR sites and the total estimated 2006 AR related trips by these anglers extrapolated from FY06 license data were used to approximate the total economic impacts and importance of these anglers relative to the SC economy. In the context of this study, economic impacts only relate to the effects of anglers in the SCNC and NSC Regions spending within the SCC Region while fishing because their fishing trip expenditures represent "new dollars" to the SCC Region[8]. Expenditures by resident anglers in South Carolina are assumed to generally affect the amount of “local” money available for spending to other sectors of the South Carolina economy. Consequently, it is assumed that a decline in SCC angler expenditures would probably shift angler disposable income to other recreationally oriented sectors. In contrast, economic importance or significance analysis recognizes spending effects of all anglers including SCC anglers. The economic importance analysis is a measure of the significance of AR fishing, not the economic impacts, within the SC economy because it quantifies the magnitude of economic activities associated with recreation fishing activities.

IMPLAN (MIG 1997) data for SC and related software were used to estimate the economic impacts and importance of anglers fishing on AR sites. IMPLAN is based on a static input-output model approach. In general, an input-output (I-O) model is a representation of the flows of economic activity within a region. The model approximates what each business or sector must purchase from every other sector in order to produce a dollar's worth of services or goods. Using an I-O model, flows of economic activity associated with any change in spending may be traced either forwards or backwards (e.g. angler expenditures on meals lead restaurants to buy additional inputs – meal ingredients, utilities, etc.). By quantifying these linkages between sectors, input-output models can approximate secondary effects of spending, usually represented in the form of multipliers.

Secondary effects of expenditures are usually classified as indirect and induced. Indirect effects are the changes in sales, income or jobs in sectors within the region or state that supply services and goods to the various recreational fishing related sectors (e.g. motels, tackle shops, etc.). Induced effects are the increased sales from household spending of the income earned by those employed by the recreational fishing and supporting sectors. These represent induced effects of the visitor spending. In order to reduce

[8]For the sake of simplicity in this report, it was assumed that all of the major fishing trip related expenditures by active SCNC and NSC AR anglers occurred in the SCC Region, but it should be noted that the mean percentage for NSC anglers for spending fishing trip expenses in SC was 83.2% (Median Percentage=100%).

double counting of resident angler expenditures, induced effects of resident anglers were excluded from the economic importance analysis.

## RESULTS

## Licensee Sampling and Artificial Reef Fishing

**Response Rates and Undeliverable Mail**

Overall, 6,207 usable mail questionnaires or Internet responses were received from licensees during the 2006 sampling (Table 2.1a). Of the 19,226 questionnaires mailed, 1,268 pieces (6.6%) were not deliverable and returned by the U.S. Postal Service for various reasons including no forwarding address and incomplete address (Table 2.1b). Consequently, about 3% to 10% of mailed survey questionnaires were returned without reaching the licensee selected for sampling

**Table 2.1a. Counts of Responses by License Regions and Recall Months during 2006**

| | | SC License Regions | | |
|---|---|---|---|---|
| **Recall Month** | **Total** | **SCC** | **SCNC** | **NSC** |
| April | 354 | 354 | n.a. | n.a. |
| May | 1,106 | 364 | 459 | 283 |
| June | 1,105 | 357 | 468 | 280 |
| July | 1,120 | 335 | 469 | 316 |
| August | 1,552 | 428 | 509 | 615 |
| September | 479 | 230 | 249 | n.a. |
| October | 491 | 229 | 262 | n.a. |
| **TOTALS:** | **6,207** | **2,297** | **2,416** | **1,494** |

**Table 2.1b. Counts of Undeliverable (RTSs) Mail by SC License Regions and Recall Months**

| | | SC License Regions | | |
|---|---|---|---|---|
| **Month** | **Total** | **SCC** | **SCNC** | **NSC** |
| April | 96 | 96 | n.a. | n.a. |
| May | 312 | 114 | 68 | 130 |
| June | 254 | 93 | 56 | 105 |
| July | 294 | 108 | 69 | 117 |
| August | 152 | 74 | 44 | 34 |
| September | 66 | 43 | 23 | n.a. |
| October | 94 | 70 | 24 | n.a. |
| **TOTALS:** | **1,268** | **598** | **284** | **386** |

Appendix Table A2.1 details the RTS (Return to Sender) rates for each region and each recall month. When comparing different recall months, August and September have the lowest RTS rates, which is probably due to the use of the newer FY07 license database for sampling starting with mailings in September. Mailings to licensees in the NSC Region (out of state license addresses) had the highest (10.4%) RTS rate before the sampling was switched to the FY07 license records and then lowest (2.7%)

monthly RTS rates after this switch. Although the 14-day non-resident license type dominates the NSC Region licenses records, those purchasing licenses were still required to provide a permanent address even when buying a 14-day license. Perhaps these non-resident licensees are more mobile and therefore change their residence more frequently than SC non-coastal licensees.

It is also unclear why mailings to licensees in the SCC Region had monthly RTS rates greater than 5.0% and an overall RTS rate, 7.7%, the same as the NSC Region's rate (Table A2.1). If 14-day licenses are associated with high RTS rates (e.g. >5%), it does not "explain" the high RTS rate for SCC Region mailings because the SCC Region is predominantly comprised of anglers purchasing annual resident licenses.

The returned responses vary by survey modes (i.e. mail questionnaire versus Internet form responses), months, and recall regions (Table A2.2). These rates were calculated based on mailings, which have not been returned from postal service as return to sender (RTS). In general, mail responses adjusted for RTSs, had 26.0% return rate; online surveys have 8.5%; in total, the study achieved a **34.6%** adjusted response rate. August, the recall month, had the highest response rate, which may have been related to using the newer FY07 license database. Similar to RTS rates, coastal SCC Region and NSC (non-resident) Region have lower response rates, which might be associated with the mobile nature of those anglers. Unadjusted response rates, which includes RTSs, was 29.9%, a little lower than adjusted rates, but still a generally acceptable rate of response for license data sampling (Table A2.3).

**Fishing Frequency and Patterns of Licensees**

The fishing frequencies and patterns of responding licensees from different regions and different months between survey modes were analyzed. Prior to this analysis, the records of 12 respondents that were probably involved in the "for-hire[9]" sector were excluded from the licensee data analysis since this survey was only focused on private boat recreational anglers. Table 2.2a details the statistics on the questions about fishing activities in the last two years. In general, 90.1% of the responding licensees reported saltwater fishing in or off SC during the last two years. The monthly rates range from around 88% to 93% and did not vary much based on a given recall month. These percentages results generally appear consistent with a recent 2005 telephone survey sponsored by the SCDNR (Responsive Management 2006) of SC Saltwater Recreational Fisheries licensees that indicated that 85% of the respondents had been saltwater fishing in and/or off SC for finfish during the past two years.

A higher percentage of licensees from the SCC and NSC (non-residents) Regions than SCNC Region licensees fished in the last two years; a higher percentage of the anglers who reported through the Internet fished in the last two years than those through mail backs, though the monthly differences were all less than 10% (Table 2.2a).

The licensees were also asked to recall the number and type of private boat SC saltwater fishing trips during the past twelve (12) months, and the percentages of respondents reporting one or more SC saltwater trips (Table 2.2b) are generally consistent with percentages in Table 2.2a, but lower because the likelihood of making a saltwater fishing trip over a 12 month period compared to the past two year period would be lower. In addition, responses indicated that about 32% of those private boat anglers completing one or more SC saltwater fishing trips during the past 12 months also completed one or more trips involving AR sites with SCC licensees having the highest percentage, 34% (Table 2.2b).

[9]Due to concern for possible "outlier effects," respondents indicating involvement in the recreational fishing industry (Question E6) and reporting more than 30 AR related fishing trips during given recall month or more than 200 saltwater fishing trips during the past 12 months were judged to be involved in commercial for-hire related fishing activities (e.g. fishing guides, charter vessel operators, etc.).

**Table 2.2a. The Percentage of Respondents Who Fished in the Last Two Years by Region, Recall Month and Survey Modes**

| Region | SCC Region | | | SCNC Region | | | NSC Region | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **Mode** | **Mail** | **Internet** | **Both** | **Mail** | **Internet** | **Both** | **Mail** | **Internet** | **Both** | |
| April | 92.6% | 92.8% | 92.7% | - | - | - | - | - | - | 92.7% |
| May | 91.1% | 93.3% | 91.7% | 84.6% | 89.7% | 85.8% | 97.0% | 97.5% | 97.2% | 90.6% |
| June | 93.5% | 94.4% | 93.8% | 83.2% | 92.0% | 85.0% | 92.8% | 94.4% | 93.2% | 89.9% |
| July | 91.3% | 93.9% | 91.9% | 85.2% | 94.9% | 87.6% | 95.6% | 98.9% | 96.5% | 91.4% |
| August | 91.1% | 94.8% | 92.1% | 83.0% | 87.5% | 84.3% | 91.8% | 94.6% | 92.3% | 89.6% |
| September | 90.6% | 97.1% | 92.6% | 84.9% | 85.7% | 85.1% | - | - | - | 88.7% |
| October | 92.5% | 97.1% | 93.9% | 81.4% | 86.2% | 82.4% | - | - | - | 87.8% |
| **Total** | **91.8%** | **94.7%** | **92.6%** | **83.8%** | **89.8%** | **85.2%** | **93.7%** | **96.3%** | **94.3%** | **90.1%** |

The percentage of licensees who reported SC saltwater fishing in the current (2006) year (Table 2.3) follows a similar trend as in Table 2.2a. In general, 63.4% of anglers fished in the current year. The monthly rates range from about 50% to 70%, and the latter months of August, September, and October have higher rates. This trend may be indicative of the higher probability of reporting a fishing trip by a licensee in the current year[10] and the effects of summer and fall fishing opportunities and/or conditions. The sampled licensees in the SCC Region have a higher current year fishing rate (71.0%) than those in the NSC and SCNC Regions; the NSC licensees had a higher rate of fishing in the current year (63.3%) than SCNC licensees (56.3%). Moreover, a higher percentage of the licensees responding through the Internet mode fished in the current year than those responding via mail questionnaires, though the differences are small.

**Table 2.2b. Percentage of Respondents Reporting SC Saltwater Fishing Trips During the Past Twelve Months and Trips Involving AR Sites by Region**

| | SCC | | SCNC | | NSC | | All | |
|---|---|---|---|---|---|---|---|---|
| **SW Trips During Past 12 Months?** | N | % | N | % | N | % | N | % |
| Completed One or More SW Fishing Trips | 2036 | 88.9% | 1888 | 78.2% | 1318 | 88.3% | 5244 | 84.6% |
| Completed One or More AR Fishing Trips | 693 | 30.3% | 577 | 23.9% | 395 | 26.5% | 1666 | 26.9% |
| % Within Those SW Fishing Reporting AR Fishing: | | **34.0%** | | **30.6%** | | **30.0%** | | **31.8%** |
| **Total Responses** | 2290 | 100.0% | 2413 | 100.0% | 1492 | 100.0% | 6195 | 100.0% |

[10]In general, the probability of a given licensee reporting one or more saltwater fishing trips during 2006 would generally increase over time within the calendar year. Stated another way, it is expected that the probability of a licensee making one or more SC saltwater fishing trips during 2006 would generally be higher when the licensee was sampled in October compared to April 2006.

**Table 2.3. The Percentage of Respondents Who Fished in the Current Year (2006) by Region, Recall Month and Survey Modes**

| Region | SCC Region | | | SCNC Region | | | NSC Region | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **Mode** | **Mail** | **Internet** | **Both** | **Mail** | **Internet** | **Both** | **Mail** | **Internet** | **Both** | |
| April | 56.8% | 52.2% | 55.9% | - | - | - | - | - | - | 55.9% |
| May | 62.4% | 64.4% | 62.9% | 40.6% | 42.1% | 40.9% | 48.3% | 48.8% | 48.4% | 50.0% |
| June | 68.4% | 66.7% | 68.0% | 46.5% | 54.0% | 48.1% | 52.2% | 57.7% | 53.6% | 55.9% |
| July | 69.2% | 80.5% | 71.9% | 57.7% | 68.4% | 60.3% | 60.6% | 62.9% | 61.3% | 64.1% |
| August | 81.2% | 87.8% | 82.9% | 64.3% | 66.0% | 64.8% | 75.7% | 75.9% | 75.7% | 74.1% |
| September | 75.6% | 85.7% | 78.7% | 64.0% | 69.8% | 65.5% | - | - | - | 71.8% |
| October | 79.2% | 82.9% | 80.3% | 64.2% | 69.0% | 65.3% | - | - | - | 72.3% |
| Total | 69.7% | 74.9% | 71.0% | 54.8% | 60.8% | 56.3% | 63.5% | 62.8% | 63.3% | 63.4% |

The percentage of licensees that reported fishing in a given recall month (Table 2.4) also followed similar trends as in Table 2.2b and Table 2.3. In general, 38.1% of anglers fished in a given recall month. The monthly rates range from around 32% to 42%, and the months after May have higher rates than the rates in April and May. Again, SCC (coastal) licensees had a higher rate of fishing (50.0%) than SCNC and NSC Region licensees; the NSC licensees had a higher rate of fishing (34.4%) than SCNC licensees (29.1%). With exceptions for responding SCC licensees, generally a higher percentage of the licensees responding via the Internet mode fished in the sampled recall month than those responding with mail questionnaires.

**Table 2.4. The Percentage of Respondents Who Fished in the Sampled Recall Month by Region, Recall Month and Survey Modes**

| Region | SCC Region | | | SCNC Region | | | NSC Region | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **Mode** | **Mail** | **Internet** | **Both** | **Mail** | **Internet** | **Both** | **Mail** | **Internet** | **Both** | |
| April | 38.2% | 36.2% | 37.9% | - | - | - | - | - | - | 37.9% |
| May | 43.5% | 53.3% | 46.0% | 22.9% | 27.1% | 23.9% | 28.1% | 31.3% | 29.0% | 32.4% |
| June | 52.1% | 46.7% | 50.7% | 25.5% | 29.0% | 26.3% | 26.3% | 43.7% | 30.7% | 35.2% |
| July | 47.0% | 65.9% | 51.6% | 28.7% | 39.3% | 31.3% | 29.2% | 37.1% | 31.4% | 37.4% |
| August | 54.6% | 67.0% | 57.9% | 31.0% | 34.0% | 31.9% | 37.8% | 50.0% | 40.1% | 42.3% |
| September | 50.0% | 54.3% | 51.3% | 31.2% | 31.7% | 31.3% | - | - | - | 40.9% |
| October | 50.9% | 64.3% | 55.0% | 30.9% | 32.8% | 31.3% | - | - | - | 42.4% |
| **Total** | **47.8%** | **56.1%** | **50.0%** | **27.9%** | **32.6%** | **29.1%** | **32.3%** | **41.2%** | **34.4%** | **38.1%** |

Table 2.5 shows the monthly percentages of responding licensees by Region that fished in AR sites in the sampled recall month. In general, approximately 11% of the licensees reporting fishing in AR sites in their recall month with percents ranging from around 7% to 12% and the months after May have higher monthly percentages than the April and May percentages (Table 2.5). Regional trends were also similar to those observed for current year fishing percents (See Table 2.4), e.g. SCC Region licensees have a higher fishing percentage at AR sites (13.2%) during their recall months than licensees in the two other Regions. Again, in general a higher percentage of licensees responding through the Internet mode fished on AR sites during their recall month than those responding with mail questionnaires.

Licensees that reported saltwater fishing in SC during the current year (2006) (See Table 2.3) included those fishing on AR sites during a given recall month, and overall, 19%, 16%, and 15% of the responding licensees in the SCC, SCNC and NSC Regions, respectively, fished on AR sites during a given sampled recall month. Also, as previously noted, percentages based upon trips during the past 12 months (See Table 2.2b) suggest that private boat fishing by SC licensees is not uncommon among those that actively saltwater fish. Additionally, the monthly (Table 2.5) and annual (See Table 2.2b) percentages of licensees making AR trips are also consistent with AR sites being among several general fishing areas

available for active saltwater anglers. For example, during 2006, the MRFSS estimated that 63% of all SC saltwater fishing trips occurred within SC internal waters ("inland"), an area with few AR sites compared to open ocean sites mainly due to the challenges of selecting feasible (e.g. stable, etc.) estuarine sites for low profile AR structures.

**Table 2.5. The Percentage of Respondents Who Fished at AR Sites by License Region, Recall Month and Survey Modes**

| **Region** | **SCC Region** | | | **SCNC Region** | | | **NSC Region** | | | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Mode** | **Mail** | **Internet** | **Both** | **Mail** | **Internet** | **Both** | **Mail** | **Internet** | **Both** | |
| April | 7.4% | 10.1% | 7.9% | - | - | - | - | - | - | 7.9% |
| May | 8.9% | 13.3% | 10.0% | 5.1% | 10.3% | 6.3% | 5.9% | 7.5% | 6.4% | 7.5% |
| June | 17.5% | 18.9% | 17.8% | 7.9% | 10.0% | 8.3% | 8.1% | 14.1% | 9.6% | 11.7% |
| July | 16.2% | 19.5% | 17.0% | 10.5% | 12.0% | 10.9% | 7.1% | 11.2% | 8.3% | 12.0% |
| August | 11.8% | 18.3% | 13.6% | 8.5% | 10.4% | 9.1% | 11.2% | 15.2% | 11.9% | 11.4% |
| September | 13.8% | 14.3% | 13.9% | 8.6% | 11.1% | 9.2% | - | - | - | 11.5% |
| October | 10.7% | 15.7% | 12.2% | 9.8% | 13.8% | 10.7% | - | - | - | 11.4% |
| **Total** | **12.2%** | **16.0%** | **13.2%** | **8.3%** | **11.0%** | **9.0%** | **8.9%** | **12.2%** | **9.7%** | **10.7%** |

**Fishing Trips by SC Marine Artificial Reef Permitted Area Sites**

Sampled licensees were asked to list the number of times they visited major sites within AR permitted areas (See Appendix 1.1, Mail Questionnaire, Question B4) for fishing during a given recall month. Standardized AR trips by Permitted Area (PA) indicated licensees reported fishing trips the most often for the PA-01 off Little River followed by PA-09 and PA-10 off Murrells Inlet (Fig. 3). Moreover, five of the top ten PAs for AR fishing trips were off Georgetown or Horry County, the SC northern coastal area (Fig. 3). Except for PA 44 (e.g. Betsy Ross), nine of the top ten PAs for responding licensees was within or near the 13-fathom line (78 feet). In addition, specific AR sites or structures (e.g., the Charleston 60' Reef, etc.) within these PAs were generally accessible (e.g. less ~2 hours of boat traveling time under normal sea conditions) from major coastal water bodies such as Charleston Harbor, Little River Inlet and Port Royal Sound. The apparent popularity of sites within these PAs is congruent with the SC Artificial Reef Program objective to provide "nearshore" AR sites that are generally accessible by private boat anglers departing from major coastal water bodies (Personal communication, R. Martore, Marine Resources Division, SCDNR).

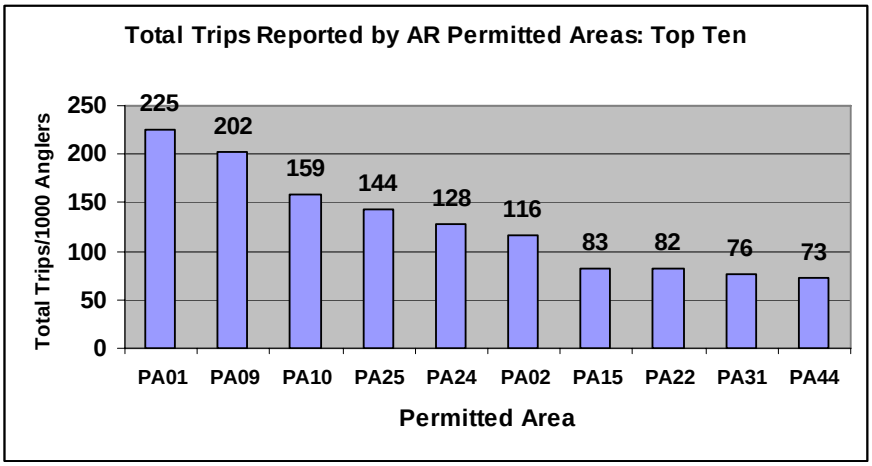
Ranking of total reported fishing trips involving the four SC inshore (estuarine) artificial reefs indicated (See Fig. 1) that the two Winyah Bay reefs (IS-01 and IS-02) were the most popular followed by IS-03 (St. Helena Sound) and IS-04 (Stono River). In addition, more total trips were reported for the two Winyah Bay reefs than 22 other open ocean PAs. Consequently, anglers are apparently utilizing SC inshore artificial reefs although not at levels of effort reported for popular oceanic AR sites. (Summaries of responses by recall month and major sites within Permitted Areas are listed in Appendix 3.)

**Fishing Trips by SC Marine Artificial Reef Permitted Area Clusters and License Regions**

To consider the possible effects of regional travel corridors and/or major access water bodies such as Murrells Inlet, Charleston Harbor and Port Royal Sound on AR angler use patterns, the 45 SC permitted marine AR areas were grouped into three north to south oriented AR permitted area "clusters" (Personal communication, R. Martore, Marine Resources Division, SCDNR). These AR clusters (See Fig. 2) were labeled the "North Cluster," "Central Cluster" and the "South Cluster" with the approximate major central access water bodies being Murrells Inlet, Charleston Harbor and Port Royal Sound, respectively. Since the intent was to roughly group permitted AR areas based upon a north to south orientation, the number of permitted site areas and related AR structures within a cluster was not considered when selecting clusters. Therefore, the North Cluster has 19 permitted AR areas, the Central Cluster has 14 and the South Cluster has 12 permitted AR areas. The following cluster analysis was also based upon aggregating responses by

Region (e.g. Table 2.6), not recall months, due to the small number of responses by AR sites within a given Region and recall month.

**Fig. 3. Top-ten AR Fishing Sites based on Total Trips Reported by Sampled Licensees during 2006**




| Site Abbreviations Used in Fig. 3 (See above) | Artificial Site Description |
|---|---|
| PA01 | PA-01: Little River, Jim Caudle |
| PA09 | PA-09: Paradise, HP Springs, Grand Strand |
| PA10 | PA-10: Ten Mile, Bruce Rush |
| PA25 | PA-25: Charleston Nearshore Reef |
| PA24 | PA-24: Charleston 60’ Reef |
| PA02 | PA-02: Little River Offshore. Barracuda Alley |
| PA15 | PA-15: Georgetown Reef |
| PA22 | PA-22: Capers Reef, R8 |
| PA31 | PA-31: Edisto 40' Reef |
| PA44 | PA-44: Betsy Ross Reef |

**Table 2.6. Total Numbers of Respondents Who Fished in Different AR Clusters**

| AR Site Cluster | License SCC Region | License SCNC Region | License NSC Region | Total |
|---|---|---|---|---|
| North | 112 | 96 | 84 | 292 |
| Central | 121 | 77 | 25 | 223 |
| South | 62 | 43 | 26 | 131 |
| Total Fished in AR Sites | 266 | 182 | 128 | 576 |
| Total Responded | 2290 | 2413 | 1492 | 6195 |

**Table 2.7 The Percentage of Respondents Who Fished in Different AR Clusters**

| AR Site Cluster | SCC Region | SCNC Region | NSC Region | Total |
|---|---|---|---|---|
| North | 4.9% | 4.0% | 5.6% | 4.7% |
| Central | 5.3% | 3.2% | 1.7% | 3.6% |
| South | 2.7% | 1.8% | 1.7% | 2.1% |
| Total | 11.6% | 7.5% | 8.6% | 9.3% [11] |

Although the total numbers of structures available for fishing vary between clusters, a summary analysis of responses (Table 2.6) within license regions generally appears congruent with the county level distribution of licensees (Table 2.7). Specifically, the highest percentage of fishing on AR permitted areas within the SCC Region, 4.9% and 5.3%, occurred in the North and Central Clusters, respectively (Table 2.7). These percentages appear to be consistent with the high percentages (~68%) of all FY06 licensees in SCC Region residing in the SC coastal counties of Berkeley, Charleston, Dorchester, Georgetown and Horry. In addition, within the NSC Region, 5.6% of the licensees had one or more fishing trips involving AR sites in the North Cluster. This percentage was probably due to North Carolina residents comprising about 45% of all FY06 NSC licensees.

The availability of GPS and other public information on offshore AR sites is often cited as one of the major desirable features of artificial reef systems, so respondents were asked to judge the possible influence of AR sites on the frequency of their saltwater fishing trips if there were no AR sites (See Appendix 1.1, Mail Questionnaire, Question B5). For AR anglers that provided AR site specific responses plus responses on whether the lack of AR sites would reduce their number of saltwater fishing trips (Table 2.8), ~54% of these respondents claimed that they would make fewer saltwater fishing trips if AR sites were not available (Table 2.9). Additionally, SCNC anglers fishing on AR sites within the Central and South Clusters had the highest percentages, perhaps implying that they are more dependent upon AR sites than anglers in other two regions.

**Table 2.8. Numbers of Respondents Who Will Take Fewer Fishing Trips without AR Sites**

| License Region | North Cluster | Central Cluster | South Cluster | Total |
|---|---|---|---|---|
| SCC | 63 | 63 | 32 | 161 |
| SCNC | 49 | 44 | 29 | 108 |
| NSC | 45 | 12 | 13 | 79 |
| Total | 157 | 119 | 74 | 348 |

[11] These percentages are generally lower than the AR trip percents in Table 2.6 because some respondents did not respond with specific AR site information (Question B4) compared to generally indicating (Question B1) that they completed one or more fishing trips involving AR sites during a given recall month.

**Table 2.9 Percentages of Active AR Anglers by Regions and Clusters Who Will Take Fewer Trips without AR Sites among Active AR Anglers**

| License Region | North Cluster | Central Cluster | South | Total |
|---|---|---|---|---|
| SSC | 56.3% | 52.1% | 51.6% | 50.2% |
| SCNC | 51.0% | **57.1%** | **67.4%** | 48.4% |
| NSC | 53.6% | 48.0% | 50.0% | 51.6% |
| Total | 56.1% | 55.1% | 60.7% | **54.1%** |

**Number of Fishing Trips by Artificial Reef Anglers by License Regions and Recall Months**

Licensees that reported making one or more fishing trips involving AR sites during a given recall month were also asked to recall the total number fishing trips (See Appendix 1.1, Mail Questionnaire, Question B2)[12] in their recall month that involved AR sites (Table 2.10). The mean overall number of trips by Region were 2.56, 2.38 and 2.71, respectively, for SCC, SCNC and NSC AR anglers (Table 2.10) with the lower monthly mean occurring for SCNC anglers, 1.75 trips, during October, and the highest, 3.08 trips, during August for NSC anglers. With the exception of NSC anglers during July, the median number of trips per recall month was 2. For purposes of conservatively extrapolating the total number of trips per month, the median is considered a better statistic than the mean.

[12]In contrast to the previous cluster analysis, this analysis includes all respondents that reported making one or more AR trips including respondents that did not provide AR site response in Question B4.

**Table 2.10. Descriptive Statistics for the Numbers of AR Trips by License Region and Recall Month**

| License Region | Statistics | April | May | June | July | August | September | October | Total |
|---|---|---|---|---|---|---|---|---|---|
| SCC Region | N | 28 | 36 | 63 | 57 | 60 | 32 | 28 | 304 |
| | Mean | 2.36 | 2.72 | 2.98 | 2.53 | 2.13 | 2.31 | 2.82 | 2.56 |
| | Median | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | Std. Deviation | 1.91 | 2.43 | 2.51 | 2.00 | 2.11 | 1.97 | 3.30 | 2.32 |
| | Std. Error of Mean | 0.36 | 0.41 | 0.32 | 0.27 | 0.27 | 0.35 | 0.62 | 0.13 |
| SCNC Region | N | - | 29 | 40 | 51 | 46 | 23 | 28 | 217 |
| | Mean | - | 2.21 | 2.43 | 2.88 | 2.17 | 2.57 | 1.75 | 2.38 |
| | Median | - | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| | Std. Deviation | - | 2.18 | 2.00 | 2.35 | 1.40 | 2.15 | 1.32 | 1.96 |
| | Std. Error of Mean | - | 0.40 | 0.32 | 0.33 | 0.21 | 0.45 | 0.25 | 0.13 |
| NSC Region | N | - | 18 | 27 | 27 | 73 | - | - | 145 |
| | Mean | - | 2.28 | 2.81 | 1.89 | 3.08 | - | - | 2.71 |
| | Median | - | 2 | 2 | 1 | 2 | - | - | 2 |
| | Std. Deviation | - | 1.49 | 3.14 | 1.28 | 2.89 | - | - | 2.59 |
| | Std. Error of Mean | - | 0.35 | 0.60 | 0.25 | 0.34 | - | - | 0.22 |
| **Total** | N | 28 | 83 | 130 | 135 | 179 | 55 | 56 | 666 |
| | Mean | 2.36 | 2.45 | 2.78 | 2.53 | 2.53 | 2.42 | 2.29 | 2.53 |
| | Median | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | Std. Deviation | 1.91 | 2.16 | 2.51 | 2.04 | 2.36 | 2.03 | 2.55 | 2.27 |
| | Std. Error of Mean | 0.36 | 0.24 | 0.22 | 0.18 | 0.18 | 0.27 | 0.34 | 0.09 |

For each AR cluster, descriptive statistics on the number of trips by AR anglers were prepared by Region and recall months (Tables A2.4, A2.5 and A2.6). The highest monthly median number of trips, 5, for all clusters occurred in June for SCNC anglers fishing on sites in the North AR Cluster (Table A2.4) and in May for SCC anglers visiting sites in the South AR Cluster (Table A2.6). In contrast, the lowest monthly median for fishing trips occurred in October for SCNC anglers in the Central AR Cluster (Table A2.5). The median of AR trips in the North AR cluster by SCNC and NSC anglers during the summer months was generally more than the monthly median trips by SCC anglers (Table A2.4). In addition, four-month (May-August) median (4 trips) and mean (5.74) for the number of trips by NSC anglers fishing on AR sites within the North AR Cluster (Table A2.4) was higher than the four-month medians and means of NSC anglers fishing in the other two AR clusters (Tables A2.5 and A2.6). This relatively high number of trips by NSC anglers fishing on sites in the North AR Cluster also appears consistent with the trends observed in Table 2.7, i.e. NSC anglers could be considered a "high" use group for AR sites off of the SC northern coastal area (Grand Strand).

**Overnight Stays in the SC Coastal by Artificial Reef Anglers**

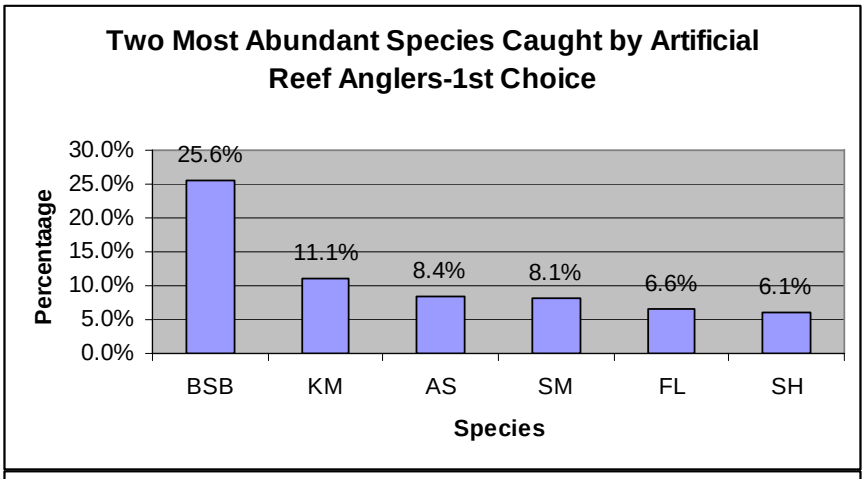
Anglers reporting on their most recent AR trip were also asked to indicate whether they stayed overnight in the SC coastal area during their fishing trip, and, if they stayed overnight, they were asked to recall the total number of nights they stayed overnight during their trip. The statistics for these responses are detailed in Table A2.7. Recognizing that this lodging question was subject to a significant item non-response, the overall regional mean number of nights associated with these AR anglers staying overnight was approximately 1.4, 3.4 and 4.7 for SCC, SCNC and NSC AR anglers, respectively (Table A2.7). The

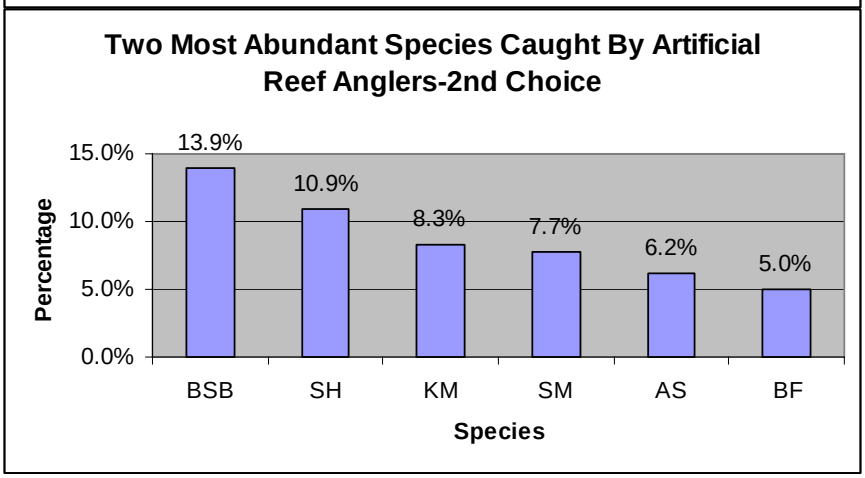
highest monthly mean and median nights for non-coastal AR anglers occurred during the summer months; these means and medians would be consistent with non-coastal anglers making multi-purpose vacation trips during the summer months. Moreover, the mean number of nights spent by SCNC AR anglers during the fall months of September and October, ~2.5 and 2.6 nights, respectively, were lower than means for the summer months associated with these SCNC anglers. In general, it appears that AR anglers when they stay overnight in the SC coastal region on a trip involving fishing on AR sites will on average spend about 3 nights in the SC coastal area during the summer months.

**Fish Species Caught by SC Artificial Reef Anglers**

AR anglers were asked to list the two most abundant species they caught during their most recent fishing trip involving an AR site **(**See Appendix 1.1, Mail Questionnaire, Question C12). For a pooling of all responses (Fig. 4), two species that were frequently listed included species that commonly aggregate on AR sites, i.e. Black Sea Bass and Atlantic Spadefish, but it is also interesting that two pelagic species, King and Spanish Mackerel, were ranked in the top six species. These pelagic species are also consistent with anglers using AR sites and/or areas near AR structures for fishing techniques involving trolling gear, "trolling alleys," not just bottom fishing.

**Fig. 4. Frequency Percentages for the Two Most Abundant Fish Species Caught (Top Six Species) on or near an SC Artificial Reef during an Angler's Most Recent Fishing, 2006**




| Species Abbreviation | Common Name |
|---|---|
| AS | Atlantic Spadefish |
| BF | Bluefish |
| BSB | Black Sea Bass |
| FL | Flounder (Spp.) |
| KM | King Mackerel |
| SH | Shark (Spp.) |
| SM | Spanish Mackerel |

As might be expected, a ranking of species listed by AR anglers by license Regions (Table 2.11) also indicated that these anglers often caught Black Sea Bass and Atlantic Spadefish as well as sharks, King and Spanish Mackerel. In contrast, flounder species were in the top five species most frequently caught by NSC anglers but not in the top five for anglers in the other two Regions.

**Table 2.11. Ranking* of the Five Top Species Caught by AR Anglers and License Regions**

| | **Overall Ranking By Angler Region** | | |
|---|---|---|---|
| **Species Targeted** | **SCC** | **SCNC** | **NSC** |
| Atlantic Spadefish | 5 | 5 | n.r |
| Black Sea Bass | 1 | 1 | 1 |
| Flounder (Any Species) | n.r. | n.r. | 2 |
| King Mackerel | 3 | 2 | 3 |
| Sharks (Any Species) | 2 | 4 | 5 |
| Spanish Mackerel | 4 | 3 | 4 |

**n.r. – Not ranked (not in top-five within Region)**

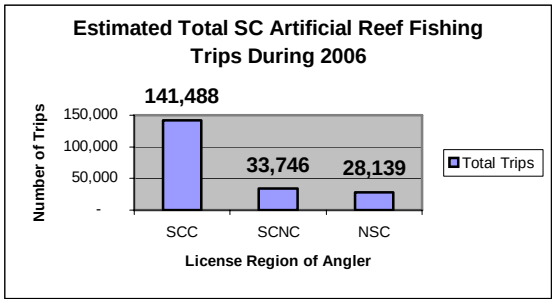
## Estimated Artificial Reef Trips and Overnight Stays by Anglers

**Estimating Total 2006 SC Artificial Reef Private Boat Fishing Trips**

Estimates of total SC private boat fishing trips involving permitted marine artificial reef sites by SC licensees during 2006 were extrapolated based on the percentage of respondents who fished on one or more AR sites during a given recall month (See Table 2.5) and the total FY06 license sales by the three licensee mail regions. Specifically, for each of the three license regions, the estimated annual total number of SC private boat trips involving AR sites was projected by summing the number of estimated number of AR related fishing trips for each month within a given license region. Within a given month and license region, the monthly fishing trips involving AR sites were estimated by multiplying the average percentage (rounded) of AR trips reported by respondents for a given time period such as the summer months (See Table 2.5 for data used for averaging monthly AR trip percentages) by the overall 2006 median number of AR trips by anglers, 2 trips per month (See Table 2.10). For the summer months, the AR trip percentage used for monthly extrapolations was the rounded average of AR trip percentages during the three summer months (i.e. June, July and August) for a given region. In addition, the AR trip percentage used for monthly extrapolations was the rounded midpoint of the AR trip percentages of the two fall months sampled (i.e. September and October), 13% and 10%, for SCC and SCNC Regions, respectively (See Table A3.1). Four major assumptions were also made when estimating total monthly AR trips during given month in 2006:

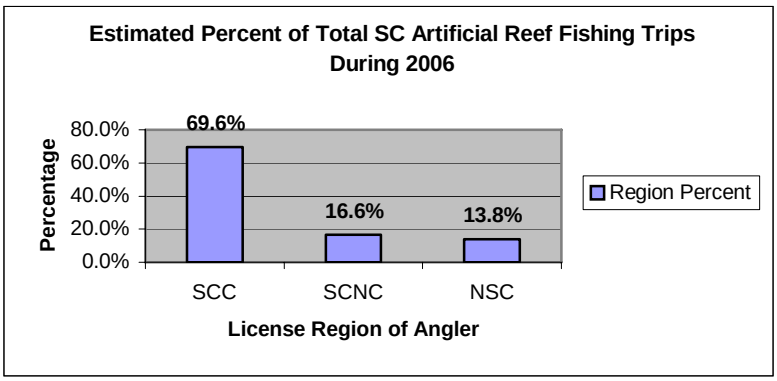
1. It was conservatively assumed that AR related fishing trips during January and February 2006 were not significant[13] partially due to winter sea conditions. This assumption is considered conservative because during short periods of favorable offshore sea conditions in January and February 2006, some SC resident coastal anglers completed AR fishing trips. Moreover, fishing trips involving inshore, estuarine AR sites (e.g. Upper Winyah Bay Inshore Reef) even when winter sea conditions prevented offshore fishing trips were not uncommon during these months.
2. NSC Region (non-residents) licensees were not sampled regarding AR trips during March and April 2006 or trips during the September-December period (See Table 1). Consequently, it was assumed the monthly AR trip percentages by NSC Region licensees during these months were approximately the same as May 2006, i.e. 6%.
3. SCNC licensees were also not sampled regarding AR trips during April 2006 so it was assumed that AR trip percentages were approximated by the May 2006 AR trip percentage rounded to 6%.
4. SCC and SCNC Region licensees were not sampled during March 2006 or during November and December, so it was assumed that monthly AR trip percentages during these months would be approximated based upon responses by SCC (8%) and SCNR (6%) Region licensees during April and May 2006, respectively.

**Fig. 5. Estimated Total Artificial Reef Fishing Trips by Private Boat Anglers during 2006**




[13] It should also be noted that the current MRFSS protocol for estimating South Carolina recreational saltwater fishing effort and catch statistics does not include sampling tasks during the months of January and February (i.e. MRFSS Wave 1) because past research indicated that recreational fishing activity during Wave 1 was not significant.

**Fig. 6. Estimated Percent of Total SC Artificial Reef Fishing Trips by License Region for Private Boat Anglers during 2006**




The projected total number SC private boat saltwater fishing trips involving permitted marine AR areas in 2006 was estimated to be about 141,490, 33,750 and 28,140 for SCC, SCNC and NSC anglers (Fig. 5), respectively, a total of ~**203,400 trips** (Fig. 5), with SCC anglers comprising 70% of the total estimated AR trips (Fig 6). Evaluating the overall reasonableness of this estimate (i.e. Is the estimate "in the ballpark?") is difficult because as previously noted the MRFSS does not estimate aggregate catch and effort statistics specifically related to fishing trips involving AR sites. Regardless, the MRFSS estimates of total ocean[14] SC saltwater private boat fishing trips off of SC during 2006 was approximately 412,500 trips (Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD). Consequently, the total number of 2006 AR related fishing trips estimated from data collected in this survey was about 49% of all 2006 ocean SC fishing trips estimated by the MRFSS. Stated another way, about 1 out of 2 ocean fishing trips during 2006 apparently involved AR sites within the SC marine artificial reef system. This percentage, 49%, generally seems reasonable given that oceanic fishing trips can also be motivated by fishing modes, species targeting (e.g. tuna, etc.) and/or areas (e.g. wrecks, natural hard-bottom areas, etc.) not usually associated with fishing on or near permitted AR sites.

Based upon a quarterly sampling of registered SC recreational boaters during 1992, the total saltwater SC fishing trips involving private boat angler visits to AR sites was estimated to be about 67,000 trips (Rhodes *et al*. 1993). A comparison between the 2006 estimate of total fishing trips by SC anglers involving AR sites, ~203,400 trips, was therefore approximately three times the total estimate for 1992. This means that the annualized rate of increase in AR related trips since 1992 through 2006 was ~14.5% per year. In contrast, the number of permitted AR areas has doubled since 1992 while the number of AR trips, as a rough proxy for nominal fishing effort, has tripled, although the number of AR sites within some new and old permitted areas has generally increased over time, too.

The MRFSS estimated for 1992 about 108,000 ocean SC saltwater private boat fishing trips off of SC (Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD) and therefore the percentage of 1992 AR trips compared to the 1992 MRFSS estimate of total ocean SC saltwater private boat fishing trips off of SC was 62%. As a percentage of MRFSS estimated ocean trips, the 1992 AR trip percentage, 62%, was higher than the percentage of AR trips in 2006 (49%), but the overall magnitude of both percentages is similar even though different approaches were used to estimate AR trips in 1992 compared to 2006. The 2006 AR trip estimate also suggests that a "rule of thumb" for roughly estimating the annual total AR related fishing trips by SC private boat anglers in the near future (e.g. over the next three to five years) would be to simply multiply the MRFSS annual ocean trips estimate for these anglers by 0.45.

[14] For 2006, the MRFSS estimated 315,521 ocean within three (3) miles or less of the shore and 97,028 ocean trips beyond three miles, a total of **412,549** ocean trips.

**Estimated Artificial Reef Trips by Anglers Staying Overnight in the SC Coastal Region**

Descriptive statistics on the number of nights anglers stayed overnight in the SC coastal area (e.g. the Grand Strand) based upon usable responses to Question C9 were summarized in Table A2.7. In addition, estimating or projecting the aggregate frequency of overnight stays or lodging in the SC coastal area by AR anglers is essential to estimating impacts associated with these anglers. Since these overnight stay totals are predicated upon estimates of total AR related fishing trips by Region (See Fig. 5), the projection of total overnight stays is presented in this section. Monthly response data on overnight stays during an AR related fishing trip (i.e. excluding item non-responses[15] for Question C9) were pooled and only analyzed by license regions (Table 3.1). In addition, a comparison between the overnight stay percents for SCNC and NSC was not significantly different and therefore, response data for these two regions (i.e. the SCNC and NSC) were also pooled into one region, "Non-SC Coastal Region," (Table 3.1) in order to simplify the estimating total AR trips by overnight stay status for AR private boat anglers and related AR expenditure patterns. The overnight stay percentage for SCCR respondents, 11.8%, was significantly lower ($p < .01$) than the percentages for Non-SC Coastal Region respondents, 68.6% (Table 3.1). In other words, it appears that nearly 70% of these non-coastal anglers stayed overnight in the SC coastal area during 2006 trips involving AR fishing.

Using the total AR trips estimates, total trips by anglers in the SCNC and the NSC Regions were pooled and overnight stay percentages (See Table 3.1) were applied to total estimates of AR trips (See Fig. 5) for each major region in order to estimate annual total trip by overnight stay status (Table 3.2) during 2006. The resulting projections by overnight stay status for the two major license regions indicates that Non-SC Coastal Region anglers that stayed overnight in the SC coastal area comprised about 21% of all AR anglers while SCC Region anglers constituted approximately 61% of all trips not involving overnight stays (Table 3.2). Consequently, the rate of overnight stays (i.e. lodging) by Non-SC Coastal Region anglers is substantial within this group of anglers, nearly 70% (See Table 3.1), as might be expected by anglers not residing in the SC coastal area, but the weighting of this overnight stay percentage by total estimated AR trips indicates that non-coastal anglers using coastal lodging during 2006 probably represent less than 25% of all AR users (Table 3.2).

**Table 3.1. Percentage of Respondents Staying Overnight in the SC Coastal Region During Their Most Recent Trip Related to Fishing on a SC Artificial Reef Site(s) During 2006**

| | | | Major Regions | | |
|---|---|---|---|---|---|
| | | | **SC Coastal Region** | Non-SC Coastal Region[1] | **Totals** |
| **Stayed Overnight?** | **Yes:** | N | 27 | 188 | 215 |
| | | % within Major Region | 11.8% | 68.6% | 42.7% |
| | **No:** | N | 202 | 86 | 288 |
| | | % within Major Region | 88.2% | 31.4% | 57.3% |
| **Totals** | | N | 229 | 274 | 503 |
| | | Percent | 100.0% | 100.0% | 100.0% |

[1]For these analyses, response data for two license regions (i.e. the SCNC and NSC) were pooled into one major region, the "Non-SC Coastal Region."

[15] The item non-response rate for Question C9 was 24% (162).

**Table 3.2. Estimated Total Annual Artificial Reef (AR) Trips by Overnight Stay Status Based on Fig. 5 (See Appendix Tables A3.1) and Table 3.1.**

| Responses by Licensees to Question C9.a. | | | Major Regions | |
|---|---|---|---|---|
| | | | **SC Coastal Region** | **Non-SC Coastal Region1** |
| **Stayed Overnight? (See Table 3.1 above)** | **Yes** | Percent | 11.8% | 68.6% |
| | **No** | Percent | 88.2% | 31.4% |
| | | | 100.0% | 100.0% |

| Estimated Total AR Trips by Overnight Stay Status Using Above Percents: | | | |
|---|---|---|---|
| **Total Estimated AR Trips:** | 141,488 | 61,885 | 203,373 |
| **Total AR Trips Involving Overnight Stays:** | **16,696** | **42,453** | **59,149** |
| Percent of Grand Total | **8.2%** | **20.9%** | **29.1%** |
| **Total AR Trips Not Involving Overnight Stays:** | **124,792** | **19,432** | **144,224** |
| Percent of Grand Total | **61.4%** | **9.6%** | **70.9%** |
| **Totals:** | **141,488** | **61,885** | **203,373** |

## South Carolina Ocean Charter Diving Trips and Scuba Divers

The following analysis of 2006 charter dive trip data including specific permitted artificial reef sites data and related intercept sampling of charter divers was aggregated in order to protect the confidentially of proprietary data collected from individual SC coastal dive shops (businesses).

### Responses and SC Charter Diver Demographics

From July through early October 2006, ten (10) oceanic dive charter trips sponsored by SC coastal dive shops involving sites off of South Carolina were sampled resulting in a total 102 usable intercept responses[16] by charter divers filling out a short self-administered intercept questionnaire (See Appendix 1.2). The number of responding divers from each sampled charter trip ranged from 5 to 16 divers per trip and averaged about 81% of the divers on given trip filling out a usable questionnaire. SC coastal dive shops completed a total of 284 SC dive charter trips involving oceanic sites during 2006; consequently 3.5% of these trips were randomly sampled during July-October in 2006.

About 72% (n=73) of the responding charter divers were not SC residents and approximately 79% of the SC resident divers (n=29) lived in SC coastal counties of the SCC Region used when sampling SC recreational saltwater fishing licensees (Table A4.1). Among the non-resident divers, the top two US states were North Carolina and Ohio, and five divers provided non-US postal codes. Since three of the four SC dive shops scheduling charter dives are located north of Georgetown in the SC Grand Strand, the contribution of North Carolina and Ohio charter divers is consistent with other Grand Strand visitor statistics. Overall, male recreational scuba divers comprised 73% of all charter divers (Table A4.1) and the mean age[17] of responding divers was 31.8 years and 37.9 years, respectively, for responding female and male divers. The mean age of responding female divers was significantly lower than the mean age of male divers (Table A4.1).

Most of the responding charter divers, 85%, reported that recreational diving (i.e. not training dives) was the type of diving they were planning for the given charter trip and, therefore, 15% reported that formal dive training activities would be part of the their charter trip activities. The mean number of dives (3.60 dives) in the past 12 months by divers involved in training activities during the their charter dives was significantly ($p < .01$) lower than dives (12.20 dives) by divers reporting their charter trip did not involve training activities. The higher number of dives by divers not involved in training activities during a sampled charter trip would be consistent with experienced recreational divers being less likely to be involved in training activities once they are beyond their initial learning/training stage.

### Visiting Divers: Primary Trip Purposes and Lodging Characteristics

Divers residing in an SC coastal county in the SCC Region will be described as SC "coastal" charter divers while divers not residing in one of SC coastal counties or visiting from other states/countries will be described as "visiting" divers, but their region is equivalent to the Non-Coastal Region used when analyzing licensee responses. Approximately 73% of all divers reported they were planning to stay one night or more in the SC coastal area during their trip and none of the SC coastal divers, 23% of all responding divers, reported they were planning to stay overnight in a hotel or at other types of visitor lodging in the SC coastal area (Table 4.1).

For responding visiting divers, 33% indicated that diving was the primary purpose[18] for visiting the SC coastal area (Table 4.1). In contrast, 53% of the visiting divers categorize their main purpose for visiting the SC coastal area as "Vacation/Pleasure". The mean number of nights that visiting divers planned to stay overnight in the SC coastal area was 5.90 nights (n=69). Hotel/motels or rental apartments/condos

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[16] Actually for the 102 responding divers, 14 respondents were from a July charter trip not involving diving on one or more SC permitted artificial reef areas. The diving expenses, age and other characteristics of these 14 responding divers were not significantly different than charter dive trips including permitted artificial reef areas. Consequently, responses by these 14 divers were combined with all other responses.

[17] These are approximate ages based on the diver's reported year of birth (Base Year=2006).

[18] Divers residing in SC coastal counties were also not asked to categorize the primary purpose of their trip.

represented the major, 70%, type of lodging reported by visiting divers followed by staying at private homes, 25%.

**Table 4.1. Count of "Visiting" and SC Coastal Scuba Divers plus Trip Purpose and Overnight Trip Occurrences of Sampled Divers during 2006**

**Count of Visiting vs. SC Coastal Divers:**

| Type of Charter Diver: | Count | Percent |
|---|---|---|
| **SC Coastal Divers:** | **23** | **22.5%** |
| **Visiting (Non-coastal Divers):** | | |
| Staying Overnight | 74 | 72.5% |
| Not Staying Overnight | 5 | 4.9% |
| **Total (Visiting Divers)** | **79** | **77.5%** |
| **Total Divers Sample:** | 102 | 100.0% |

**Purpose of coastal trip and whether they stayed overnight in coastal South Carolina for visiting (non-coastal) divers (only):**

| | Visiting Diver Stayed Overnight? | | | |
|---|---|---|---|---|
| **Purpose of Trip by Visiting Divers:** | **No** | **Yes** | **Total** | **% of All Visiting Divers** |
| **Mainly for Charter Diving in SC:** | 3 | 23 | 26 | 32.9% |
| Row % | 11.5% | 88.5% | 100.0% | |
| **Vacation/Pleasure:** | 0 | 42 | 42 | 53.2% |
| Row % | 0.0% | 100.0% | 100.0% | |
| **Business/Other:** | 0 | 5 | 5 | 6.3% |
| Row % | 0.0% | 100.0% | 100.0% | |
| **No Response:** | 2 | 4 | 6 | 7.6% |
| Row % | 33.3% | 66.7% | 100.0% | |
| **Total Visiting Divers:** | 5 | 74 | 79 | 100.0% |
| Row % | 6.3% | 93.7% | 100.0% | |

**Total SC Oceanic Charter Diving Trips During 2006**

As previously noted, a total of 284 charter dive trips to sites off of SC were completed by SC coastal dive shops during 2006 and 64% (181) of these trips (Table 4.2) were completed during the summer months, i.e. June-August. Trips involving one or more dives on structures within SC permitted artificial reef sites, 166 trips, represented 59% of all SC charter oceanic dive trips during 2006 with 109 (38%) of these trips being completed during the summer months. Consequently, it is apparent that man-made structures within SC permitted artificial reef sites generally benefit SC dive shops by providing desirable offshore diving destinations. Specific uses of these sites on dive trips range from diver training to use by recreational divers interested in recording the variety of fish species observed on these structures.

During 2006, a total of 3,571 divers participated in these SC offshore dive trips with 53% of these divers (1,902 divers) participating in trips involving one or more dives on structures within SC permitted artificial reef sites (Table 4.2). In other words, man-made structures within SC permitted artificial reef areas are important because these structures provide dive sites commonly used for SC diver charter trips. A simple projection (extrapolation) of these charter diver aggregates using diver intercept data (see Table 4.3) indicates that visiting divers, mainly non-residents, staying overnight in the SC coastal area comprised about 73% (2,591) of all SC charter divers (Table 4.2). In addition, visiting divers participating in charter

dive trips with one or more SC artificial reef sites probably represented a substantial portion, ~39% (1,380), of all SC charter divers (Table 4.2) during 2006.

**Table 4.2. Total Number of Oceanic Recreational Dive Charter Trips off of South Carolina (SC) and Related Divers by SC Dive Shops during 2006 including Charter Trips Involving One or More Ocean (Open-water) Dives on SC Permitted Marine Artificial Dive Sites**

| | Time Period | | | | | |
|---|---|---|---|---|---|---|
| | Summer Months | | Other Months | | Both Periods | |
| **Type of Dive Sites** | **Count** | **% of All** | **Count** | **% of All** | **Totals** | **% of All** |
| **Trips with dives on one or more SC marine artificial reef sites:** | | | | | | |
| **Total Trips:** | **109** | **38.4%** | **57** | **20.1%** | **166** | **58.5%** |
| **Total Number of Divers:** | **1,386** | **38.8%** | **516** | **14.4%** | **1,902** | **53.3%** |
| **Trips with no dives on SC marine artificial reef sites:** | | | | | | |
| Total Trips: | 72 | 25.4% | 46 | 16.2% | 118 | 41.5% |
| Total Number of Divers: | 1,195 | 33.5% | 474 | 13.3% | 1,669 | 46.7% |
| **All SC Charter Trips and Divers, 2006:** | | | | | | |
| Total Trips: | 181 | 63.7% | 103 | 36.3% | **284** | **100.0%** |
| Total Number of Divers: | 2,581 | 72.3% | 990 | 27.7% | **3,571** | **100.0%** |

**Projected Number of SC Charter Divers by Regions, Overnight Stay and Type of Dive Site:**

| **Projected Number of Divers by Regions and Overnight Lodging:** | Time Period | | | | | |
|---|---|---|---|---|---|---|
| | Summer Months | | Other Months | | Both Periods | |
| **SC Artificial Reef Charter Trips:** | **Divers** | **% of All** | **Divers** | **% of All** | **Divers** | **% of All** |
| **Visiting Divers Staying Overnight:** | 1,006 | 28.2% | 374 | 10.5% | **1,380** | **38.6%** |
| **Visiting Divers Not Staying:** | 68 | 1.9% | 25 | 0.7% | **93** | **2.6%** |
| **Visiting (Non-Coastal) Diver Totals:** | 1,073 | 30.1% | 400 | 11.2% | **1,473** | **41.3%** |
| **SC Coastal Divers:** | 313 | 8.8% | 116 | 3.3% | **429** | **12.0%** |
| **Total:** | 1,386 | 38.8% | 516 | 14.4% | **1,902** | **53.3%** |
| **SC Non-Artificial Reef Dive Trips:** | | | | | | |
| Visiting Divers Staying Overnight: | 867 | 24.3% | 344 | 9.6% | 1,211 | 33.9% |
| Visiting Divers Not Staying: | 59 | 1.6% | 23 | 0.7% | 82 | 2.3% |
| Visiting (Non-Coastal) Diver Totals: | 926 | 25.9% | 367 | 10.3% | 1,293 | 36.2% |
| SC Coastal Divers: | 269 | 7.5% | 107 | 3.0% | 376 | 10.5% |
| Total: | 1,195 | 33.5% | 841 | 23.6% | 2,962 | 82.9% |
| **All SC Ocean Charter Diving Trips:** | | | | | | |
| Visiting Divers Staying Overnight: | 1,872 | 52.4% | 718 | 20.1% | 2,591 | 72.5% |
| Visiting Divers Not Staying: | 127 | 3.5% | 49 | 1.4% | 175 | 4.9% |
| Visiting (Non-Coastal) Diver Totals: | 1,999 | 56.0% | 767 | 21.5% | 2,766 | 77.5% |
| SC Coastal Divers: | 582 | 16.3% | 223 | 6.3% | 805 | 22.5% |
| **Total:** | **2,581** | **72.3%** | **990** | **27.7%** | **3,571** | **100.0%** |

## Economic Impacts and Importance of the SC Artificial Reef System

The estimating of economic impacts and importance of private boat anglers and charter divers related to the use of SC permitted marine artificial reef sites was predicated upon estimating total (aggregate) annual trip expenditures for each user group based upon their daily trip expenditures times the total number of estimated trips by major regions and overnight trip status. These projected expenditure aggregates for each user group were then used in an input-output (I-O) model, IMPLAN, which approximated the flows of economic activity within the SC coastal counties comprising the SCC Region.

**Daily Trip Expenditures of Artificial Reef Anglers**

Respondents completing one or more AR related fishing trips in a sampled recall month in 2006 were asked to recall trip expenditures specific to the most recent trip during a recall month (See Appendix 1.1, Question C10). Based upon analysis of overnight stay status (See previous "Overnight Stays by Anglers" section), expenditure responses were pooled and analyzed by the two major regional license address groups, the SCC Region and combination of the SCNC and NSC Regions (i.e. the Non-Coastal Region). The mean total daily trip expenditures by responding private boat anglers making an AR related fishing trip during a sampled month ranged from $548 for Non-Coastal Region anglers staying overnight to about $255 for SCC Region anglers not staying overnight (Table 5.1). It is apparent from the summarized expenditure patterns (See Appendix 2, Table A5.1) of the AR anglers that fuel/oil, lodging, car/truck fuel, and restaurant expenses contributed to the higher total trip expenditures by anglers staying overnight compared to those who did not.

**Table 5.1. Mean Total Daily Trip Expenditures by AR Anglers by Major Regions and Overnight Stay (Lodging) Status During 2006**

| Major Region | Stayed Overnight? | N | Mean | Std. Error of Mean |
|---|---|---|---|---|
| **SC Coastal Region:** | **Yes** | 27 | 456.5767 | 101.96917 |
| | **No** | 199 | 254.9296 | 45.30877 |
| | Total | 226 | 279.0202 | 41.87204 |
| **Non-Coastal Region:** | **Yes** | 184 | 548.2511 | 69.13089 |
| | **No** | 82 | 277.5122 | 49.06488 |
| | Total | 266 | 464.7903 | 50.68247 |
| Total | **Yes** | 211 | 536.5203 | 61.65151 |
| | **No** | 281 | 261.5196 | 35.09502 |
| | **Total** | 492 | 379.4569 | 33.70541 |

**Daily Expenditure Patterns of SC Charter Divers**

Mean daily trip expenses by both visiting (non-coastal) and SC coastal divers are needed for estimating both the economic impacts and importance of SC charter divers in the SC coastal area. Estimating trip expenses (i.e. diving and non-diving related expenses) using the primary data collected required reviewing estimated daily expenditures by responding divers in order to judge the significance of these expenses. For divers spending one or more nights in the SC coastal area, daily expenses were approximated by dividing the total trip expenses reported for a given non-diving expense category (e.g. lodging) by the number of nights the diver's traveling party expected to spend in the local area.
For specific diving expenses, purchases reported by interviewed divers, mainly charter and gear rental fees charged the by SC dive shops that sponsored the charter trip, were combined. A subsequent comparative analysis of these dive trip expenses by diver type (e.g. SC coastal divers, visiting divers staying overnight, etc.) indicated that diver type means for diving expenses were not statistically different, so a pooled (overall) mean, ~$125, for diving trip expenses was calculated (Table 5.2). In addition, due to the small number of observations (n=5) for resident SC (i.e. SC non-coastal divers) visiting divers not staying overnight as well as the intercept instrument not being designed to collect non-diving trip (e.g. local retail

food store expenditures, etc.) related expenditures by SC coastal divers, the individual expenditures by these two diver types were treated as being insignificant (Table 5.2).

The total mean daily expenditures by visiting (non-coastal) charter divers staying overnight were $381 and diving and daily lodging expenses comprised 33% and 27%, respectively, of this total (Table 5.2) so combined diving and lodging expenses represented about 60% of these visiting charter diver daily expenses. Estimated daily total non-diving expenses for these visiting charter divers, $256, comprise about 67% of all daily expenditures (Table 5.2).

**Table 5.2. Mean Daily Expenditures of Responding Intercepted South Carolina Charter Divers during 2006**

| | Type of Charter Diver | | | | | |
|---|---|---|---|---|---|---|
| **Daily Expenditure Categories:** | **SC Coastal Divers & Visiting Divers Not Staying Overnight[1]** | | **Visiting Divers Staying Overnight[3]** | | **Visiting Charter Divers: Percent Contribution by Category** | |
| | **Mean** | **SE** | **Mean** | **SE** | **All** | **Without Diving Expenses** |
| **Dive Fees & Gear Rental[2]** | $ 124.67 | 4.048 | $ 124.67 | 4.048 | 32.7% | NA |
| **Lodging** | | | $ 103.68 | 13.165 | 27.2% | 40.4% |
| **Foodservice** | | | $ 58.69 | 5.033 | 15.4% | 22.9% |
| **Auto/Truck Fuel & Oil[4]** | | | $ **24.40** | n.a. | 6.4% | 9.5% |
| **Retail Store Food** | | | $ 23.88 | 3.006 | 6.3% | 9.3% |
| **Entertainment** | | | $ 22.05 | 3.238 | 5.8% | 8.6% |
| **Misc. Retail** | | | $ 19.04 | 2.428 | 5.0% | 7.4% |
| **Other Expenses (e.g. parking)** | | | $ 4.58 | 1.201 | 1.2% | 1.8% |
| **Totals (Sum of Means):** | **$ 124.67** | | **$ 381.00** | | 100.0% | 100.0% |
| **Total Without Diving Expenses:** | | | **$ 256.33** | | | |

**SE-Standard error of the mean.**

[1]Non-diving expenditures by SC coastal divers and visiting charters divers not staying overnight were considered insignificant.

[2] Diving expenses were pooled (n=102) because these expenses were not significantly different between groups ("Type of Diver").

[3]Except for diving expenses and "Lodging" (n=52), the number of sample observations, n, for all other expenses were 59.

[4]There was substantial item non-response to the fuel expense question by responding charter divers. Consequently, the mean auto/truck fuel and oil expenditure for SC inshore anglers was used.

**Economic Impacts and Importance of SC Artificial Reef Anglers and Charter Divers**

The estimated total (aggregate) trip expenditures by private boat anglers making an AR related fishing trips, $28.7 million, during 2006 had an estimated total sales (output) impact of about $39 million and generated 470 jobs. From an economic importance perspective, all private boat anglers making saltwater fishing trips involving a visit to SC permitted artificial reef sites during 2006 represented an estimated ~$83 million in total sales and 991 jobs (Table 5.3). Total expenditures by non-coastal charter divers making SC charter trips involving one or more dives on an AR site during 2006 generated a total sales impact of approximately $740,000 and about 13 jobs (Table 5.4), and represented ~$802,000 of total sales. Therefore, the combined total estimated expenditures of both AR anglers and charter divers

represented a total economic importance of about $83.3 million and generated over one thousand (1,000) jobs during 2006. Although precisely estimating the total annual economic impacts and importance directly attributable to the SC marine artificial reef system is problematic, it is readily apparent that just the magnitude of AR user trip expenditures should clearly indicate that this system, as developed and managed by the SCDNR, is clearly a significant component of the entire SC coastal economy. In addition, the man-made structures within SC permitted artificial reef areas, as recreational outdoor "destinations," are a relevant component of the economic impacts generated by a special group or subset of tourists, i.e. anglers and scuba divers.

**Table 5.3. Estimated Total Economic Impacts and Importance of Saltwater Recreational Fishing Licensees using Private Boats and making Saltwater Fishing Trips involving SC Permitted Artificial Reef (AR) Areas during 2006**

| Estimate Sales (Output) Impact in 2006 Dollars Based on AR Angler Daily Trip Expenses | | | | | | |
|---|---|---|---|---|---|---|
| **Region of AR Angler Groups** | **Estimated Total Trips[1]** | **Expenditures[2]** | **Direct Effects[3]** | **Indirect Effects[4]** | **Induced Effects[5]** | **Total Effects** |
| Non-Coastal Anglers | 61,885 | $28,667,580 | $26,128,982 | $6,286,167 | $6,568,829 | **$38,983,978** |
| SC Coastal Anglers | 141,488 | $39,435,967 | $34,953,169 | $8,626,967 | n.a. | $43,580,136 |
| Economic Importance | 203,373 | $68,103,547 | $61,082,151 | $14,913,134 | $6,568,829 | **$82,564,114** |
| | | **Sales Multiplier[6] Based on Total Expenditures:** | | | | **1.212** |

| Estimate Job[7] Impact Based on Estimated Number of AR Trips, 2006 | | | | | | |
|---|---|---|---|---|---|---|
| **Group** | **Estimated Total Trips[1]** | **Direct Effects[3]** | **Indirect Effects[4]** | **Induced Effects[5]** | **Total** | |
| **Non-Coastal Anglers** | **61,885** | **340** | **54** | **76** | **470** | |
| SC Coastal Anglers | 141,488 | 448 | 74 | n.a. | 521 | |
| **Totals** | **203,373** | **787** | **128** | **76** | **991** | |
| | | **Job Multiplier[8] per 1,000 AR Angler Trip:** | | | **4.87** | **Jobs** |

[1]Total estimated fishing trips related to AR sites based upon sampling of SC saltwater recreational licensees during this study.

[2]Total estimated expenditures by AR anglers as estimated in this study.

[3]Immediate effects of angler expenditure plus leakages from the region. For example, angler spending on hotel would contribute to hotel sales & jobs.

[4]Indirect effects are in sales, income or jobs in sectors within the state that supply goods & services to the recreational fishing/tourism sectors.

[5]Induced effects are the sales within the region from household spending of the income earned in the recreational fishing and supporting sectors. Hotel or tackle shop employees spend the income they earn from anglers on housing, utilities, groceries, etc. These represent induced effects of the visiting angler spending.

[6] A sales multiplier calculated by dividing the Total Effects by Total Expenditures by SC coastal and non-coastal AR anglers.

[7]The jobs may not be FTEs, i.e. these jobs could include part-time seasonal jobs.

[8]The job multiplier used in this table is the ratio of jobs generated by expenditures per 1000 trips by AR anglers.

**Table 5.4. Estimated Total Economic Impacts and Importance of South Carolina Charter Dive Trips involving SC Permitted Artificial reef (AR) Areas during 2006.**

| Estimate Sales (Output) Impact in 2006 Dollars Based on AR Diver Trip Expenses | | | | | | |
|---|---|---|---|---|---|---|
| **AR Charter Diver Groups** | **Total AR Dive Trips[1]** | **Expenditures[2]** | **Direct Effects[3]** | **Indirect Effects[4]** | **Induced Effects[5]** | **Total Effects** |
| Visiting (Non-Coastal) Charter Divers | 1,473 | $537,357 | $493,216 | $101,646 | $145,364 | $740,226 |
| SC Coastal Divers | 429 | $53,469 | $50,262 | $11,614 | n.a. | $61,876 |
| Economic Importance | 1,902 | $590,826 | $543,478 | $113,260 | $145,364 | $802,101 |
| | | **Sales Multiplier[6] Based on Total Expenditures:** | | | | **1.358** |

**Estimate Job[7] Impact Based on Estimated Number of AR Trips, 2006**

| **Group** | **Estimated Total Trips[1]** | **Direct Effects[3]** | **Indirect Effects[4]** | **Induced Effects[5]** | **Total** |
|---|---|---|---|---|---|
| Non-Coastal Divers | 1,473 | 10.4 | 1.0 | 1.6 | 13.1 |
| SC Coastal Anglers | 429 | 0.2 | 0.1 | n.a. | 0.3 |
| Totals | 1,902 | 10.6 | 1.1 | 1.6 | 13.3 |
| | | **Job Multiplier[8] per 1,000 Charter Divers:** | | | **7.00 Jobs** |

[1]Total SC charter diving trips related to AR sites during 2006.

[2]Total estimated expenditures by SC charter divers.

[3]Immediate effects of diver expenditures plus leakages from the region. For example, diver spending on hotel would contribute to hotel sales & jobs.

[4]Indirect effects are in sales, income or jobs in sectors within the state that supply goods & services to the recreational fishing/tourism sectors.

[5]Induced effects are the sales within the region from household spending of the income earned in the charter diving and supporting sectors. Hotel or tackle shop employees spend the income they earn from anglers on housing, utilities, groceries, etc.

[6] A sales multiplier calculated by dividing the Total Effects by Total Expenditures for both diver groups.

[7]The jobs may not be FTEs, i.e. these jobs could include part-time seasonal jobs.

[8]The job multiplier used in this table is the ratio of jobs generated from expenditures per 1,000 AR charter divers.

## RECOMMENDATIONS

The following recommendations will focus of the socioeconomic aspects of artificial reef usage, evaluation and related management issues. This emphasis is not only consistent with the authors' economic and social research expertise but is also congruent with one of the core purposes of artificial reef systems, i.e. to serve human uses, such as recreational fishing and scuba diving (Milon *et al.* 2000). Moreover, unless the sole purpose of an artificial reef is to mitigate negative environmental impacts or to conduct research, an artificial reef will be viewed by many decision makers based on specific user group benefits (e.g. satisfaction of anglers fishing) and other benefits (e.g. economic impacts on local communities, etc.) associated with the reef.

1. As noted in this report's "Introduction," the last usage-oriented survey of the SC marine artificial reef system was completed in 1992, more than 13 years ago. The use of the SC artificial reefs (AR) by saltwater anglers nearly tripled during this time period and during any given year over 30% of SC licensed active saltwater private boat anglers complete one or more trips involving AR sites. Although the SCDNR will remain responsive to the needs of AR user groups, the continued apparent overall growth of the SC saltwater angler and offshore scuba diver population would generally indicate that systematic surveys of AR anglers should be conducted more often, such as every 5 to 7 years.

2. The major goal of this study was to collect primary data needed to estimate selected statistics and projected aggregates related to the use (e.g. the total number of 2006 saltwater fishing trips involving a visit to one or more AR sites) of the SC artificial reef system and the economic impacts of the AR system. It is also recognized that SCDNR has and will continue to routinely solicit and poll AR users regarding their opinions and preferences regarding the SC artificial reef sites and related issues. Regardless, the authors believe that a comprehensive and systematic preference and opinion oriented survey of AR user groups would also be beneficial to current and future management of the SC artificial reef system along with usage oriented surveys. Moreover, it is recommended that future surveys include the collection of user group preference data needed for methodologies such as stated preference choice models (SPCM)[19].

3. The use of AR sites by SC scuba diving shops and their charter diving clients has been quantitatively documented in this study, and they represent a significant user of the SC artificial reef system. It is also known that SC private boat recreational scuba divers use the SC artificial reef system and during this study pretest work was done to identify and sample this group of divers. The pretest results indicated that identifying, enumerating and randomly sampling the population of these private boat scuba divers is both methodologically challenging and could be very costly relative to the apparent AR use level of these divers. In contrast, even a qualitative oriented understanding of private boat scuba divers would still be beneficial to the current and future management of the SC artificial reef system. Therefore, it is recommended that SCDNR consider more qualitative survey approaches for targeting private boat recreational scuba divers and cost effective survey methods such as Internet questionnaires to collect usage and other management oriented information regarding this scuba diving group.

4. Given that total expenditures by non-resident or "tourist" AR anglers are substantial, it seems almost obligatory to recommend that the promotion of the SC artificial reef system as an "off-season" fishing destination for tourist anglers needs to be considered. It is also recognized that resident SC AR users could be concerned with promotional efforts targeting potential tourist AR users, if they feel it could further intensify capacity oriented problems (e.g. congestion, declines in catch rates of popular fish species, etc.) at their favorite AR sites. Recognizing these and/or other concerns by SC resident anglers, the apparent seasonal nature of AR usage (See Appendix Table A3.1) does suggest that the promotion of AR fishing by tourist anglers during the spring and fall months[20] might be a consideration by coastal tourism interests if

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[19] Traditional research designs like angler opinion polls ask respondents to provide their preferences using a series of single-item questions. This traditional single-item approach can result in failure to identify the relative and interacting (conjoint) importance of one attribute to anothers.

[20] The authors acknowledge that this recommendation could also be subject to criticism by SC residents that may prefer to fish and/or dive on their favorite AR sites during these "off-season" months mainly because the level of congestion, fishing pressure and related problems is much lower during these months compared to the summer months.

SCDNR and other appropriate fisheries management agencies believe that the possibility of stimulating additional fishing pressure by AR tourist anglers on popular AR sites will not significantly escalate fishery sustainability risks. Possible off-season “angler friendly” promotional activities targeting the apparent niche market segment of tourist AR and other saltwater anglers by local coastal communities could include encouraging restaurants and motels to have specials and weekday packages for visitors, enlisting local anglers to host contacts with visitors interested in saltwater fishing and/or hosting information sessions with local tourism interests in conjunction with SCDNR. These promotional efforts should also actively include the involvement of local “for-hire” fishing businesses including fishing guides and dive shops. Specifically, this type of promotional efforts should also be sensitive to enhancing the demand for local for-hire fishing services perhaps by highlighting these services as a viable alternative for fishing and/or diving on AR sites for visitors.

5. The analysis presented in this report was by design mainly focused on AR usage statistics and applying these statistics to estimate total AR fishing trips, and then using these trip aggregates along with the expenditure data collected on AR users to estimate the economic impacts of the SC marine artificial reef system. In contrast, the analytical emphasis reflected in this report should not be considered the final use of the primary data collected during this study. The authors encourage the SCDNR staff to consider other approaches to analyzing the primary data collected during this survey, especially the sample data collected from licensees including those respondents that were not active AR users during the time periods sampled. In other words, we encourage the SCDNR to view the data collected as a viable database available for additional and future “data mining” by the SCDNR staff.

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# Appendices: Economic Impact and Use Survey of South Carolina Artificial Reef Users: Private Boat Anglers and Charter Divers, 2006

## APPENDIX 1.1

**Mail Questionnaire Used for Monthly Sampling of South Carolina Saltwater Recreational Fishing Licensees.** (This is an example of the questionnaire used on the first to sampled licensees during June 2006 asking for recall regarding SC marine artificial reef trips during May 2006.)

## MARINE RESOURCES DIVISION, SCDNR
## 2006 SC Marine Artificial Reef System Usage & Economic Impact Survey

You have been selected for a survey regarding saltwater fishing in and off South Carolina (**SC**), including fishing on SC marine artificial reef sites. We would greatly appreciate it if you would **complete and return this questionnaire even if you do not normally fish in South Carolina**. **FREE HAT! The first 60 respondents who return a completed questionnaire will receive a FREE HAT**. **YOU HAVE TWO EASY WAYS TO RESPOND TO THIS SURVEY: Complete this questionnaire and return it using the enclosed postage-paid envelope OR using a computer, type in the following address in your web browser: http://www.dnr.sc.gov/fishsurvey/ You must use the ID number on your cover letter and your questionnaire if you want to respond via our Internet site.** *At no time will individual responses be linked to the names or specific addresses of the respondents when summarizing the results of this survey.* **Please contact Bob Martore at 843-953-9303, martoreb@.dnr.sc.gov, if you desire more details about this survey.** THANK YOU VERY MUCH!

## Section A: Saltwater Fishing in South Carolina

***In this section, we ask you about saltwater fishing trips in South Carolina. Saltwater fishing includes fishing in the open ocean or any portion of a sound, bay, river, or creek that has brackish water or saltwater. Unless asked, please do not include information on other fishing party members.***

A1. **Have you been saltwater fishing in** South Carolina or off of the South Carolina coast **during** the past two years?

☐ Yes ☐ No

The following questions are about saltwater fishing in or off of South Carolina from a private boat. By a PRIVATE BOAT, we mean a boat owned or co-owned by you or someone you know that is used privately for fishing trips and not for profit nor for chartered fishing trips.

A2. **How often do you saltwater fish** in South Carolina from a private boat**?**
(Please check the one best response.)

☐ **Always** ☐ **Often** ☐ **Sometimes** ☐ **Rarely** ☐ **Never**

A3. During the past 12 months**, please estimate the number of** fishing trips **in a** PRIVATE BOAT **at any of the following types of** saltwater habitats in/off South Carolina**.** (If you fished at more than one site in a given day, please credit each habitat with a trip.)

(a) Artificial reefs: ____ # of Trips.
(b) Wrecks: ____ # of Trips.
(c) Live bottom areas: ____ # of Trips.
(d) Creeks/bays: ____ # of Trips.
(e) Ocean inlets/jetties: ____ # of Trips.
(f) Open Ocean: ____ # of Trips.

A4**. Have you been saltwater fishing in** South Carolina or off of the South Carolina coast during the current year (2006)?

☐ Yes ☐ No ➔ PLEASE GO TO SECTION E (Question E1) ON PAGE 6.

A5. Did you go saltwater fishing in South Carolina or off of the South Carolina coast during MAY 2006 in a private boat? *(i.e.* a *boat owned or co-owned by you or someone you know that is used privately for fishing trips and not for profit nor for chartered fishing trip.)*

☐ Yes ☐ No ➔ PLEASE GO TO SECTION E (Question E1) ON PAGE 6.

**[PLEASE GO TO QUESTION A6 ON THE NEXT PAGE (PAGE 2).]**

**A6. During your MAY 2006 saltwater fishing trip in &/or off of South Carolina** in a **private boat,** please estimate the **number of trips** for **each type** of saltwater fishing in this table. (**Enter 0, if no fishing trips were completed by a given area.**)

| **Private Boat Fishing Trips during MAY 2006 by Areas** | **Trips** |
|---|---|
| a) Fishing in **creeks, bays, or sounds (Estuarine sites):** | |
| b) Near shore **ocean waters**, **but LESS than 3 miles from shore**: | |
| **c) In ocean waters, MORE than 3 miles from shore:** | |

## Section B: Marine Artificial Reef Fishing During MAY 2006

***In this section, we want to know about your MAY 2006 private boat saltwater fishing trips that included SC permitted artificial reef sites, if any, and the private boat you used.***

**B1**. **During MAY 2006, did you make any private boat fishing trips that involved fishing on or near SC marine artificial reef sites? IF you are not sure of what are SC artificial reef sites, please see list of sites on Page 3 or go to: http://saltwaterfishing.sc.gov/artificialreef.html**

☐ Yes ☐ No ➔ PLEASE GO TO SECTION E (Question E1) ON PAGE 6.

⬇

**B2**. **During the month of MAY 2006**, approximately how many **private boat fishing trips** did you make where you fished on or near **South Carolina artificial reefs**? ☐ **# of Trips**

**B3. Overall**, during the months of **MAY 2006,** approximately how many **private boat fishing trips** did you make where you fished **EXCLUSIVELY on or near South Carolina artificial reefs**, **i.e. you did not fish at any other locations on these trips?**

☐ **# of Trips (This number of trips should be less than or equal to your response to Question B2 above.)**

**B4. PLEASE GO TO THE NEXT PAGE (Page 3) WITH SC MARINE ARTIFICIAL REEF PERMIT AREA SITES to estimate the total number of trips ("visits") you made to each given site using a PRIVATE BOAT, if any, during the entire month of MAY 2006. If you fished on more than one site in a day during May, please credit each artificial reef site with a "visit" next to the site's name on the list (See page 3). [Here is a hypothetical example: Assume you made 4 SC saltwater fishing trips in MAY 2006 that involved fishing on/near SC artificial reef sites. If you visited 2 different sites during each of these trips, then you would have made 8 different visits to SC artificial reef sites during MAY 2006, i.e. 4 fishing trips TIMES 2 sites per trip = 8 visits.]**

**B5. Do** you think you would have taken fewer saltwater fishing trips in or off of South Carolina during MAY 2006 if there were no artificial reef?: (Please check one.) ☐ No ☐ Yes ☐ Not sure

**B6.** Do you **personally own or co-own one or more boats** that are ever used **for saltwater recreational fishing**?

☐ **Yes** ☐ **No ➔ PLEASE GO TO QUESTION C1 ON PAGE 4.**

⬇

1) Approximately what **percentage of time are your boats used for saltwater recreational fishing?** ☐ **% [Please estimate the saltwater fishing usage percentage based upon on total days for ALL uses of your boat(s), but NOT for 365 days/year.]**

2) What are the **length and horsepower of the boat you own or co-own and used the most often during the past 12 months for SC artificial reef trips?**

a. **Length**: ☐ **feet.** b. **HP**: ☐ c. **Fuel?** ☐ Gas ☐ Diesel

**3)** Did you **purchase this boat** (See previous question above) **during the past 12 months**?

☐ **Yes** ☐ **No**

**4) Do you generally own or co-own this boat so you can fish on SC marine artificial reef sites?**

☐ **No** ☐ **Yes** ☐ **Not sure** (Check One)

**[PLEASE GO TO QUESTION C1 ON PAGE 4.]**

**B4. Please enter the estimated number of your total May 2006 "visits" to the SC artificial reef sites listed.**

| Permitted Areas &Sites | | Permitted Areas &Sites | | Permitted Areas &Sites | |
|---|---|---|---|---|---|
| PA-01 | **Visits** | PA-18 | **Visits** | PA-36 | **Visits** |
| Jim Caudle Reef | ☐ | Greenville Reef | ☐ | Edisto Offshore Reef | ☐ |
| Little River Reef | ☐ | Ralph H. Skelton Reef | ☐ | | |
| | | PA-19 | Visits | PA-38 | Visits |
| PA-02 | Visits | Cape Romain Reef | ☐ | Fripp Island Reef | ☐ |
| Little River Offshore Reef | ☐ | | | | |
| Barracuda Alley | ☐ | PA-20 | Visits | PA-39 | Visits |
| | | Hector Reef | ☐ | Hunting Isl. State Park Pier | ☐ |
| PA-03 | Visits | | | | |
| Will Goldfinch Reef | ☐ | PA-22 | Visits | PA-40 | Visits |
| | | Capers Reef | ☐ | Hunting Island Reef | ☐ |
| PA-06 | Visits | R8 | ☐ | 6HI | ☐ |
| BP-25 Reef | ☐ | | | | |
| | | PA-23 | Visits | PA-41 | Visits |
| PA-08 | Visits | Y-73 Reef | ☐ | General Gordon Reef | ☐ |
| Bill Perry Jr. Reef | ☐ | | | | |
| | | PA-24 | Visits | PA-42 | Visits |
| PA-09 | Visits | Charleston 60' Reef | ☐ | Beaufort 45' Reef | ☐ |
| Paradise Reef | ☐ | | | | |
| H.P. Springs Jr. Reef | ☐ | PA-25 | Visits | PA-43 | Visits |
| Grand Strand SW Anglers | ☐ | Charleston Nearshore Reef | ☐ | Parris Island Reef | ☐ |
| | | Air Force Reef | ☐ | | |
| PA-10 | Visits | Charleston Coastal Anglers | ☐ | PA-44 | Visits |
| Ten Mile Reef | ☐ | Charleston Community Reef | ☐ | Betsy Ross Reef | ☐ |
| Eleven Mile Reef | ☐ | | | | |
| Bruce Rush Reef | ☐ | PA-26 | Visits | PA-45 | Visits |
| | | Folly Beach Fishing Pier | ☐ | Fish America Reef | ☐ |
| PA-11 | Visits | | | | |
| Pawleys Island Reef | ☐ | PA-27 | Visits | PA-47 | Visits |
| | | Comanche Reef | ☐ | White Water Reef | ☐ |
| PA-12 | Visits | Doug Mellichamp Jr. Reef | ☐ | | |
| North Inlet Reef | ☐ | | | PA-48 | Visits |
| | | PA-28 | Visits | Eagle's Nest Reef | ☐ |
| PA-13 | Visits | Lowcountry Anglers' Reef | ☐ | | |
| Wayne Upchurch Reef | ☐ | | | PA-49 | Visits |
| | | PA-29 | Visits | Hilton Head Reef | ☐ |
| PA-14 | Visits | Kiawah Reef | ☐ | Tire Reef | ☐ |
| Georgetown Reef | ☐ | 4KI | ☐ | | |
| | | | | **⬇INSHORE REEFS** | |
| PA-15 | Visits | PA-30 | Visits | | |
| Georgetown Nearshore | ☐ | Edisto 60' Reef | ☐ | IS-01 | **Visits** |
| Capt. Sam Crayton Reef | ☐ | | | **(Upper) Winyah Bay Inshore** | ☐ |
| | | PA-31 | Visits | | |
| PA-16 | Visits | Edisto 40' Reef | ☐ | IS-02 | Visits |
| C.J. Davidson Jr Reef | ☐ | | | **(Lower) Winyah Bay Inshore** | ☐ |
| | | PA-32 | Visits | | |
| PA-17 | Visits | N. Edisto Nearshore Reef | ☐ | IS-03 | Visits |
| Vermillion Reef | ☐ | | | **St. Helena Sound Inshore** | ☐ |
| | | PA-34 | Visits | | |
| | | CCA-McClellanville Reef | ☐ | IS-04 | Visits |
| | | Jimmy Leland Reef | ☐ | **Stono River Inshore Reef** | ☐ |

**⬅PLEASE RETURN TO PAGE 2 (QUESTION B5) AFTER YOU COMPLETE THIS QUESTION.**

**Section C: Most Recent Artificial Reef Fishing DURING MAY 2006**

***In this section, we need you to recall information only about your MOST RECENT private boat fishing trip during MAY 2006 involving fishing on or near an SC permitted artificial reef site, if any. PLEASE CAREFULLY PRINT YOUR RESPONSES.***

**C1.** What was the **DATE** of your **MOST RECENT SC saltwater fishing trip during MAY 2006** that involved **fishing on/near** an **SC permitted artificial reef site(s)**:
**DATE OF TRIP: May _____, 2006** **[ONLY YOUR MOST RECENT MAY TRIP.]**

**C2.** Please **print the name(s) of the SC permitted artificial reef area(s) you fished on/near during your most recent trip in MAY 2006 (See list on Page 3 for the artificial reef site names):**
**Name(s) of site/area:** _____

**C3.** Please **print the name** of **boat ramp/ marina** (e.g., **name of ramp, marina, private dock**, etc.) you **used on this specific fishing trip in MAY 2006 (See Question C1's date above)**:
**Name of departure location (e.g. boat ramp, marina, etc.)**: _____

**C4.** For this specific trip **(See Question C1's date above) involved fishing on a near-shore or offshore SC artificial reef site, please print the name of the bay, sound, harbor or inlet you used to access the open ocean on this SC artificial reef trip in MAY 2006:**
**You accessed the open ocean by**: _____

**C5.** In what **city and state did you begin this most recent (MAY 2006) fishing trip** involving **fishing on or near SC artificial reef sites** using a private boat? **[Please enter your RESIDENT city, state, & zip code, IF this May 2006 SC artificial fishing trip was part of a longer trip in which you spent at least one night way from your residence (e.g. vacation trip to the SC coastal area).]**
**City:** _____ **State:** _____ **Zip Code**: _____

**C6.** Did you need to **take time off from work without pay** to take this trip?
☐ No ☐ Yes

**C7.** Including yourself, **how many people were in your party** on this trip?
_____ **# of People**

**C8.** Including yourself, how **many people went fishing** on this most recent trip?
_____ **# of People**

**C9.** Was this **MAY 2006 fishing trip** involving artificial reef sites a **part of a longer trip in which you spent at least one night way from your residence?**
☐ Yes ☐ No ➔ PLEASE GO TO QUESTION C10 ON THE NEXT PAGE (Page 5).
🡻

a. Did you make this trip **primarily to go fishing**?
☐ No ☐ Yes

b. How many **nights were you away** from where you live on this most recent trip?
_____ **Nights**

c. How many **days** of your recent trip were **spent fishing**?
_____ **Days (Please count partial days as full days.)**

**[Please go to Question C10 on the next page (page 5).]**

**C10.** For this specific **MAY 2006** SC artificial reef trip indicated in **Question C1**, please estimate **how much money YOU PERSONALLY SPENT during this fishing trip**. If you **paid for others**, please indicate how many people you paid for, but **DO NOT include any costs paid by others for you**. **Please round your estimates to the nearest dollar.**

| EXPENSES RELATED TO YOUR MOST RECENT PRIVATE BOAT ARTIFICIAL REEF FISHING TRIP IN MAY 2006: | Your Expenses | Total Number of People You Paid For (Including you) |
|---|---|---|
| Bait Purchases (Your share) | $ .00 | |
| Ice (Your share) | $ .00 | |
| Boat Fuel & Oil (Your share) | $ .00 | |
| Fishing Tournament/Derby Fees | $ .00 | |
| Fishing tackle (rented or bought for this trip) | $ .00 | |
| Access & boat launching fees | $ .00 | |
| Parking fees at marinas or ramps | $ .00 | |
| Meals & drinks: Restaurants & bars | $ .00 | |
| Drinks & food: Convenience/grocery stores | $ .00 | |
| Lodging (e.g. motel) or Camping Fees, etc. | $ .00 | |
| Auto/Truck/RV Fuel | $ .00 | |
| Auto/RV Rental Fees | $ .00 | |
| Airfare/Plane Tickets | $ .00 | |
| Other: | $ .00 | |

**C11.** Approximately what **percentage of** related fishing trip expenses **for this most recent** (**MAY 2006**) fishing trip (**See Question C1**) **were purchased in South Carolina**?

**% purchased in South Carolina (0% to 100%).**

**C12. Please print the names of the TWO (2) most abundant fish species CAUGHT on or near SC ARTIFICIAL REEF SITES during this most recent MAY 2006 trip:**

1. 2.

## Section D: Expenditures on Fishing Related Equipment and Vacation Homes

***In this section, we ask you about your expenditures on fishing gear during the previous 12 months. Again, please give us only the total amount you paid, i.e. your share, if you co-own a particular item.***

**D1. During the past 12 months, did you purchase any fishing gear (e.g. rods, lures, knives, tackle etc.)?**

Yes No ➔ PLEASE GO TO QUESTION D2 BELOW.

**D1.1 EXCLUDING boat and boating related expenditures, please estimate** your **TOTAL** personal **purchases for saltwater fishing gear items during the last 12 months: $ .00**

**D1.2 What percentage of this fishing gear was purchased from retailers & other businesses** (e.g. tackle shops) **in South Carolina: % (0% to 100%).**

**D2.** Do you **own a second home** (e.g. summer home) **in South Carolina** that is ever **used for saltwater recreational fishing trips**?

Yes No ➔ PLEASE GO TO SECTION E ON THE LAST PAGE (Page 6).

**D3.** Please estimate the **percentage of time** during a year you use this **second home in South Carolina for recreational saltwater fishing.** **%**

PLEASE GO TO SECTION E ON THE LAST PAGE (Page 6).

## Section E: Information about You and Your Fishing Experience

***The following questions will provide information that will help us better understand who fishes in South Carolina and to forecast future demand for marine artificial reef sites and recreational fishing in general. Again, all responses are strictly confidential.***

E1. **What year were you** born? 19 ☐

E2. **Are you…?** ☐ Male ☐ Female

**E3.** What is the **highest level of education** you have completed? (Please **check one.**)

- ☐ Less than 9th grade
- ☐ Some high school (no diploma)
- ☐ High school graduate (including GED)
- ☐ Associate degree or technical school
- ☐ Some college (no degree)
- ☐ College graduate (bachelor degree)
- ☐ Professional or advanced degree.

**E4.** What best **describes your employment status**? (Please **check all that apply**)

- ☐ Unemployed
- ☐ Full-time homemaker
- ☐ Retired
- ☐ Employed full-time
- ☐ Employed part-time
- ☐ Self-employed
- ☐ Student (part-time)
- ☐ Student (full-time)
- ☐ Military (full-time)

E5. **How many** years have you been saltwater recreational fishing? ☐ Years

**E6.** Are you currently **employed by or own a business related** to the **SC recreational fishing industry** (e.g., a fishing guide, tackle shop employee, etc.)? ☐ **No** ☐ **Yes**

**E7**. What is your **race**? (Please **check all that apply**)

- ☐ White
- ☐ Asian
- ☐ Black/African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ American Indian /Alaska Native

**E8.** Please **check one** category below that describes your **household's total annual income before taxes in 2005**. (Only **check one** category.)

- ☐ Less than $9,999
- ☐ $10,000 - $14,999
- ☐ $15,000 - $24,999
- ☐ $25,000 - $34,999
- ☐ $35,000 - $49,999
- ☐ $50,000 - $74,999
- ☐ $75,000 - $99,999
- ☐ $100,000 - $149,999
- ☐ $150,000 - $199,999
- ☐ $200,000 or more

**E9. Please print the mailing address you would like us to mail your hat to IF you qualify to receive a FREE HAT:**

| | |
|---|---|
| **Your Name:** | |
| **Mailing Address:** | |

**E10.** Can the **College of Charleston's Dept. of Hospitality & Tourism Mgt.** send you **information** about joining their **SC fishing license survey panel**? ☐ **NO** ☐ **YES**

☐ **Please check this if you would like to receive a summary of this DNR survey results.**

**THANK YOU FOR TAKING YOUR TIME TO FILL OUT THIS QUESTIONNAIRE.** PLEASE PUT IT INTO THE **ENCLOSED POSTAGE-PAID ENVELOPE** AND **MAIL IT BACK TO US AS SOON AS POSSIBLE**. If you do not have a postage-paid envelope, please mail to **Robert Martore, SC Marine Resources Center, PO Box 12559, Charleston, SC 29422-2559. Please contact Robert Martore at 843-953-9303** if you desire additional details about this survey. **THANK YOU!**

**Please feel free to give any comments you desire in the area below: ⬇**

**Appendix 1.2. Questions on 2006 Diver Intercept Card (Actual Questionnaire used during Diver Intercepts was Formatted and Printed on Both Sides of a 5 inch by 8 inch Card)**

**PLEASE HELP the SC Marine Resource Division (MRD) gather critical information on diving in & off of South Carolina! Please fill out this form and leave it with the MRD interviewer.** You are helping us obtain information important to recognizing the economic impact of diving in South Carolina. **ALL RESPONSES ARE CONFIDENTIAL**. For more info, regarding this survey, **please contact: (NAME OF CONTACT, DNR E-MAIL ADDDRESS, AND PHONE #)**. **THANK YOU.**

Today's date is: (month/day/year): _____/_____/_____

**PROFILE OF DIVER:**

**1a.** Your **resident state**: _____ **1b. YOUR ZIP CODE:** _____

**2.** What year were you born? _____ **3. Gender**: **Male** **Female**

**4.** Please estimate the **number of dives you made during the past 12 months**: (Circle one category)

1-10 11-20 21-40 41-60 61-80 81-100 101+

**PROFILE OF CURRENT DIVE TRIP: [DATE OF YOUR MOST RECENT SC DIVE, IF NOT TODAY: _____]**

**5**. What type of dives are you planning **today (or your most recent dive) in &/or off of SC**? (Please **check one category** that best applies):

☐ Recreational dives ☐ Training dives ☐ Research dive ☐ Other: _____

**6.** What group or individuals will **you be diving with today**? (Please **check one category** that best applies)

☐ Charter by this shop ☐ Diving with friends on a private boat ☐ Other: _____

**7.** How many **dives** do you plan to conduct **today**? (Circle one category)

0 dives 1 dive 2 dives 3+ dives

**8. What are the locations of the SC dives you will be making today? (Please print.)1st dive**: _____**2nd dive**: _____**9. For today's dive trip**, **please estimate how much money you expect to spend on today's SC dive trip**:

$ _____ Charter fee (if any)
$ _____ Diving equipment rented cost (if any)
$ _____ Daily launching and/or docking fee (if any)
$ _____ **Boat** fuel and oil (your share)
$ _____ Air for **your personal** tank (local shop)
$ _____ Other local purchases (please list) _____

**[PLEASE TURN THIS CARD OVER]**

**PLEASE CONTINUE TO QUESTION 10 IF YOU ARE NOT A RESIDENT OF CHARLESTON, BEREKELY, HORRY, GEORGETOWN, DORCHESTER Or OTHER SC COASTAL COUNTIES (IF YOU ARE A "LOCAL" OR RESIDED IN A SC COASTAL COUNTY, PLEASE GO TO QUESTION 16.)**

**10.** Was your **main purpose** in traveling to the SC coast to **dive**?

**YES** **NO**

**11. If NOT diving**, what is your **main purpose** for visiting SC coastal area? (Please **check one** category that best applies):

☐ Business ☐ Vacation/Pleasure ☐ Convention ☐ Other: _____

**12.** What means of transportation did you use to arrive in the SC coastal area? (Please **check one** category)

☐ Personal vehicle ☐ Air ☐ Rental vehicle ☐ Other: _____

**13.** How many **total nights** do you plan to be away from home for your SC coastal trip?

**_____ # Nights (GO to Question 14)**

(**IF only a day trip, GO to Question 15.)**

**14.** Where are you staying during your visit to the SC coastal area? (Please **circle one** category that best applies):

☐ Hotel/Motel ☐ Private home ☐ Rental apt/Condo
☐ Bed & Breakfast ☐ Second home ☐ Campground

## Appendix 1.2. (Continued) Questions on 2006 Diver Intercept Card

**15. MOST IMPORTANT QUESTION OF ALL:**
**Thinking about your vacation/trip to the SC coastal area, how much will your party spend on the following items:**

| Expected Purchases in the Local Area on This Trip: | Dollars |
|---|---|
| **Lodging** (hotel, condo rental, campground, etc.): | |
| **Restaurant & Fast Food Outlet Purchases:** | |
| **Supermarket/Quick Stop Purchases:** | |
| **Attractions/Entertainment** (e.g. golf, museums, etc.): | |
| **Shopping** (e.g. gifts, souvenirs): | |
| **Other Local Purchases** (Specify): | |

**16. PLEASE PROVIDE YOUR NAME & MAILING ADDRESS IF IT IS OK TO MAIL YOU A FOLLOW-UP QUESTIONNAIRE:**

**NAME:** _____

**ADDRESS:** _____

**THANK YOU.**

**(ALL RESPONSES INCLUDING ADDRESSES ARE CONFIDENTIAL & WILL ONLY BE USED BY THE SCDNR.)**

## Appendix 2: Tables of Selected Response Data

**Table A1. Population of Fiscal Year 2005-06 (FY06) and Fiscal Year 06-07 (FY07) SC Saltwater Recreational Fishing License Holders Sampled by License Address Regions for the 2006 Artificial Reef User Survey, 2006.**

| | | | **SC License Regions** | | | **Regions Percent within a Fiscal Year** | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Mailing Months** | **Fiscal Year** | **FY Total[1]** | **SC Coastal** | **SC Non-Coastal** | **Out of State** | **Total** | **SC Coastal** | **SC Non-Coastal** | **Out of State** |
| May-Aug. | FY06 | 102,440 | 60,986 | 21,913 | 19,541 | 100.0% | 59.5% | 21.4% | 19.1% |
| Sept.-Nov. | FY07[2] | 87,021 | 52,934 | 20,013 | 14,074 | 100.0% | 60.8% | 23.0% | 16.2% |

**Sampling by mailing months, recall months and SC license address regions, 2006.**

| **Sample Mailing/Recall Months** | | | **SC License Regions** | | | **Mail Sample Percents[3] within a Fiscal Years** | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mailing Month | Recall Month | Total | SC Coastal | SC Non-Coastal | Out of State (NSC) | Total | SC Coastal | SC Non-Coastal | Out of State (NSC) |
| MAY | APRIL | 1,260 | 1,260 | - | - | - | 2.1% | - | - |
| JUNE | MAY | 3,750 | 1,250 | 1,250 | 1,250 | 3.7% | 2.0% | 5.7% | 6.4% |
| JULY | JUNE | 3,750 | 1,250 | 1,250 | 1,250 | 3.7% | 2.0% | 5.7% | 6.4% |
| AUG | JULY | 3,750 | 1,250 | 1,250 | 1,250 | 3.7% | 2.0% | 5.7% | 6.4% |
| SEPT | AUG | 3,750 | 1,250 | 1,250 | 1,250 | 4.3% | 2.4% | 6.2% | 8.9% |
| OCT | SEPT | 1,483 | 770 | 713 | - | 1.7% | 1.5% | 3.6% | - |
| NOV | OCT | 1,483 | 770 | 713 | - | 1.7% | 1.5% | 3.6% | - |
| ALL MAILINGS: | | 19,226 | 7,800 | 6,426 | 5,000 | na | na | na | na |
| TOTALS: FY06: | | 12,510 | 5,010 | 3,750 | 3,750 | 12.2% | 8.2% | 17.1% | 19.2% |
| TOTALS: FY07: | | 6,716 | 2,790 | 2,676 | 1,250 | 7.7% | 5.3% | 13.4% | 8.9% |

[1]Regions based upon counts of license entered with county codes.

[2]FY07 counts are based upon updates of FY07 licenses through October 2006.

[3]Percent of all usable license records used within a given license region and FY. For example, the June sample mailing to NSC licensees (May recall month) was 6.4% of all usable FY06 licenses in the NSC region.

**Table A2.1 RTS Rates by License Regions and Recall Month**

| | Count of RTS by License Regions | | | | RTS Percentage by License Regions | | | |
|---|---|---|---|---|---|---|---|---|
| **Recall Month** | **Total** | **SCC** | **SCNC** | **NSC** | **Total** | **SCC** | **SCNC** | **NSC** |
| April | 96 | 96 | - | - | 7.6% | 7.6% | - | - |
| May | 312 | 114 | 68 | 130 | 8.3% | 9.1% | 5.4% | 10.4% |
| June | 254 | 93 | 56 | 105 | 6.8% | 7.4% | 4.5% | 8.4% |
| July | 294 | 108 | 69 | 117 | 7.8% | 8.6% | 5.5% | 9.4% |
| August | 152 | 74 | 44 | 34 | 4.1% | 5.9% | 3.5% | 2.7% |
| September | 66 | 43 | 23 | - | 4.5% | 5.6% | 3.2% | - |
| October | 94 | 70 | 24 | - | 6.3% | 9.1% | 3.4% | - |
| **Total** | **1,268** | **598** | **284** | **386** | **6.6%** | **7.7%** | **4.4%** | **7.7%** |

**Table A2.2. Adjusted Response Rates by Survey Mode, Months and License Regions**

| **Recall Month** | **Survey Mode** | **Total** | **SCC Region** | **SCNC Region** | **NSC Region** |
|---|---|---|---|---|---|
| April | Mail | 24.5% | 24.5% | - | - |
| | Internet | 5.9% | 5.9% | - | - |
| | Total | 30.4% | 30.4% | - | - |
| May | Mail | 24.1% | 23.9% | 29.8% | 18.1% |
| | Internet | 8.1% | 8.1% | 9.1% | 7.1% |
| | Total | 32.2% | 32.0% | 38.8% | 25.3% |
| June | Mail | 24.1% | 23.1% | 30.8% | 18.3% |
| | Internet | 7.5% | 7.8% | 8.4% | 6.2% |
| | Total | 31.6% | 30.9% | 39.2% | 24.5% |
| July | Mail | 24.1% | 22.2% | 29.8% | 20.0% |
| | Internet | 8.3% | 7.2% | 9.9% | 7.9% |
| | Total | 32.4% | 29.3% | 39.7% | 27.9% |
| August | Mail | 32.8% | 26.6% | 30.2% | 41.3% |
| | Internet | 10.4% | 9.8% | 12.0% | 9.3% |
| | Total | 43.1% | 36.4% | 42.2% | 50.6% |
| September | Mail | 24.4% | 22.0% | 27.0% | - |
| | Internet | 9.4% | 9.6% | 9.1% | - |
| | Total | 33.8% | 31.6% | 36.1% | - |
| October | Mail | 26.1% | 22.7% | 29.6% | - |
| | Internet | 9.2% | 10.0% | 8.4% | - |
| | Total | 35.3% | 32.7% | 38.0% | - |
| Total | Mail | 26.0% | 23.7% | 29.7% | 24.7% |
| | Internet | 8.5% | 8.2% | 9.6% | 7.7% |
| | **Total** | **34.6%** | **31.9%** | **39.3%** | **32.4%** |

**Table A2.3. Unadjusted Response Rates by Survey Mode, Months and Regions**

| Recall Month | Survey Mode | Total | SCC Region | SCNC Region | NSC Region |
|---|---|---|---|---|---|
| April | Mail | 22.6% | 22.6% | - | - |
| | Internet | 5.5% | 5.5% | - | - |
| | Total | 28.1% | 28.1% | - | - |
| May | Mail | 22.1% | 21.8% | 28.2% | 16.2% |
| | Internet | 7.4% | 7.4% | 8.6% | 6.4% |
| | Total | 29.5% | 29.1% | 36.7% | 22.6% |
| June | Mail | 22.5% | 21.4% | 29.4% | 16.7% |
| | Internet | 7.0% | 7.2% | 8.0% | 5.7% |
| | Total | 29.5% | 28.6% | 37.4% | 22.4% |
| July | Mail | 22.2% | 20.2% | 28.2% | 18.2% |
| | Internet | 7.7% | 6.6% | 9.4% | 7.1% |
| | Total | 29.9% | 26.8% | 37.5% | 25.3% |
| August | Mail | 31.4% | 25.0% | 29.1% | 40.2% |
| | Internet | 9.9% | 9.2% | 11.6% | 9.0% |
| | Total | 41.4% | 34.2% | 40.7% | 49.2% |
| September | Mail | 23.3% | 20.8% | 26.1% | - |
| | Internet | 9.0% | 9.1% | 8.8% | - |
| | Total | 32.3% | 29.9% | 34.9% | - |
| October | Mail | 24.5% | 22.7% | 29.6% | - |
| | Internet | 8.6% | 10.0% | 8.4% | - |
| | Total | 33.1% | 32.7% | 38.0% | - |
| **Total** | **Mail** | **24.3%** | **21.9%** | **28.4%** | **22.8%** |
| | **Internet** | **8.0%** | **7.5%** | **9.2%** | **7.1%** |
| | **Total** | **32.3%** | **29.4%** | **37.6%** | **29.9%** |

**Table A2.4. Statistics on the Numbers of Fishing Trips in North AR Cluster by License Region and Recall Month**

| License Region | Statistics | April | May | June | July | August | September | October | Total |
|---|---|---|---|---|---|---|---|---|---|
| SCC Region | N | 12 | 15 | 28 | 19 | 18 | 10 | 10 | 112 |
| | Mean | 4.42 | 4.27 | 4.64 | 3.37 | 3.61 | 6.60 | 4.40 | 4.34 |
| | Median | 3 | 2 | 3 | 2 | 2.5 | 2.5 | 2 | 2.5 |
| | Std. Deviation | 3.40 | 5.48 | 5.42 | 3.17 | 3.18 | 8.55 | 6.11 | 4.99 |
| | Std. Error of Mean | 0.98 | 1.42 | 1.02 | 0.73 | 0.75 | 2.70 | 1.93 | 0.47 |
| SCNC Region | N | - | 16 | 15 | 24 | 18 | 14 | 9 | 96 |
| | Mean | - | 3.44 | 9.40 | 5.29 | 6.39 | 4.36 | 7.56 | 5.91 |
| | Median | - | 3 | 5 | 3 | 4.5 | 3 | 3 | 3 |
| | Std. Deviation | - | 2.16 | 11.92 | 8.12 | 8.22 | 3.63 | 12.66 | 8.29 |
| | Std. Error of Mean | - | 0.54 | 3.08 | 1.66 | 1.94 | 0.97 | 4.22 | 0.85 |
| NSC Region | N | - | 13 | 14 | 13 | 44 | - | - | 84 |
| | Mean | - | 3.15 | 3.93 | 9.54 | 5.95 | - | - | 5.74 |
| | Median | - | 2 | 4 | 3 | 4 | - | - | 4 |
| | Std. Deviation | - | 3.31 | 1.77 | 18.69 | 6.33 | - | - | 8.79 |
| | Std. Error of Mean | - | 0.92 | 0.47 | 5.18 | 0.95 | - | - | 0.96 |
| Total | N | 12 | 44 | 57 | 56 | 80 | 24 | 19 | 292 |
| | Mean | 4.42 | 3.64 | 5.72 | 5.63 | 5.53 | 5.29 | 5.89 | 5.26 |
| | Median | 3 | 2 | 4 | 3 | 4 | 3 | 2 | 3 |
| | Std. Deviation | 3.40 | 3.83 | 7.44 | 10.61 | 6.30 | 6.11 | 9.62 | 7.38 |
| | Std. Error of Mean | 0.98 | 0.58 | 0.99 | 1.42 | 0.70 | 1.25 | 2.21 | 0.43 |

**Table A2.5. Statistics on the Numbers of Fishing Trips in Central AR Cluster by License Region and Recall Month**

| License Region | Statistics | April | May | June | July | August | September | October | Total |
|---|---|---|---|---|---|---|---|---|---|
| SCC Region | N | 12 | 15 | 21 | 29 | 23 | 9 | 12 | 121 |
| | Mean | 3.50 | 3.47 | 4.90 | 4.03 | 4.43 | 2.78 | 4.83 | 4.12 |
| | Median | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| | Std. Deviation | 3.53 | 3.25 | 4.98 | 5.64 | 5.06 | 2.22 | 5.02 | 4.66 |
| | S. Error of Mean | 1.02 | 0.84 | 1.09 | 1.05 | 1.06 | 0.74 | 1.45 | 0.42 |
| SCNC Region | N | - | 9 | 14 | 22 | 18 | 6 | 8 | 77 |
| | Mean | - | 3.22 | 2.50 | 3.95 | 5.39 | 2.00 | 2.13 | 3.60 |
| | Median | - | 3 | 2 | 3 | 2 | 2 | 1.5 | 2 |
| | Std. Deviation | - | 1.99 | 1.56 | 3.32 | 9.48 | 0.89 | 1.55 | 5.07 |
| | Std. Error of Mean | - | 0.66 | 0.42 | 0.71 | 2.23 | 0.37 | 0.55 | 0.58 |
| NSC Region | N | - | 3 | 5 | 5 | 12 | - | - | 25 |
| | Mean | - | 4.00 | 1.80 | 2.40 | 7.50 | - | - | 4.92 |
| | Median | - | 3 | 2 | 2 | 3 | - | - | 2 |
| | Std. Deviation | - | 3.61 | 0.84 | 1.14 | 12.54 | - | - | 8.96 |
| | Std. Error of Mean | - | 2.08 | 0.37 | 0.51 | 3.62 | - | - | 1.79 |
| Total | N | 12 | 53 | 56 | 40 | 27 | 20 | 15 | 223 |
| | Mean | 3.50 | 5.45 | 3.86 | 3.68 | 3.44 | 3.75 | 2.47 | 4.03 |
| | Median | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 |
| | Std. Deviation | 3.53 | 8.66 | 4.55 | 3.92 | 2.82 | 4.17 | 1.81 | 5.42 |
| | Std. Error of Mean | 1.02 | 1.19 | 0.61 | 0.62 | 0.54 | 0.93 | 0.47 | 0.36 |

**Table A2.6. Statistics on the Numbers of Fishing Trips in South AR Cluster by License Region and Recall Month**

| License Region | Statistics | April | May | June | July | August | September | October | Total |
|---|---|---|---|---|---|---|---|---|---|
| SCC Region | N | 6 | 5 | 9 | 12 | 14 | 8 | 8 | 62 |
| | Mean | 3.33 | 7.00 | 10.11 | 4.00 | 3.43 | 5.75 | 11.50 | 6.13 |
| | Median | 3 | 5 | 2 | 3.5 | 2.5 | 3.5 | 2 | 3 |
| | Std. Deviation | 1.86 | 5.66 | 19.32 | 2.89 | 3.61 | 5.95 | 23.65 | 11.55 |
| | Std. Error of Mean | 0.76 | 2.53 | 6.44 | 0.83 | 0.96 | 2.10 | 8.36 | 1.47 |
| SCNC Region | N | - | 6 | 7 | 8 | 12 | 3 | 7 | 43 |
| | Mean | - | 3.33 | 7.71 | 3.13 | 7.42 | 5.00 | 4.71 | 5.49 |
| | Median | - | 2.5 | 2 | 3 | 2.5 | 3 | 3 | 3 |
| | Std. Deviation | - | 3.01 | 10.08 | 1.46 | 16.32 | 4.36 | 4.79 | 9.68 |
| | Std. Error of Mean | - | 1.23 | 3.81 | 0.52 | 4.71 | 2.52 | 1.81 | 1.48 |
| NSC Region | N | - | 1 | 4 | 6 | 15 | - | - | 26 |
| | Mean | - | - | 4.50 | 4.00 | 3.40 | - | - | 3.81 |
| | Median | - | 6 | 4.5 | 3 | 2 | - | - | 3 |
| | Std. Deviation | - | . | 3.11 | 3.63 | 2.59 | - | - | 2.81 |
| | Std. Error of Mean | - | . | 1.55 | 1.48 | 0.67 | - | - | 0.55 |
| Total | N | 6 | 12 | 20 | 26 | 41 | 11 | 15 | 131 |
| | Mean | 3.33 | 5.08 | 8.15 | 3.73 | 4.59 | 5.55 | 8.33 | 5.46 |
| | Median | 3 | 3.5 | 2.5 | 3 | 2 | 3 | 2 | 3 |
| | Std. Deviation | 1.86 | 4.38 | 13.98 | 2.66 | 9.12 | 5.35 | 17.37 | 9.75 |
| | Std. Error of Mean | 0.76 | 1.26 | 3.13 | 0.52 | 1.42 | 1.61 | 4.48 | 0.85 |

**Table A2.7 Statistics on the Numbers of Nights Away by License Region and Recall Month**

| License Region | Statistics | April | May | June | July | August | September | October | Total |
|---|---|---|---|---|---|---|---|---|---|
| SCC Region | N | 4 | 4 | 15 | 17 | 8 | 5 | 3 | 56 |
| | Mean | 1.00 | 1.50 | 1.73 | 1.53 | 0.75 | 0.20 | 2.33 | 1.36 |
| | Median | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 1 |
| | Std. Deviation | 1.15 | 1.91 | 2.15 | 1.87 | 1.04 | 0.45 | 1.53 | 1.73 |
| | Std. Error of Mean | 0.58 | 0.96 | 0.56 | 0.45 | 0.37 | 0.20 | 0.88 | 0.23 |
| SCNC Region | N | - | 18 | 31 | 35 | 27 | 13 | 18 | 142 |
| | Mean | - | 2.67 | 3.61 | 4.40 | 3.04 | 2.46 | 2.61 | 3.35 |
| | Median | - | 3 | 3 | 4 | 2 | 3 | 2 | 3 |
| | Std. Deviation | - | 1.57 | 2.46 | 2.20 | 2.16 | 1.85 | 2.28 | 2.24 |
| | Std. Error of Mean | - | 0.37 | 0.44 | 0.37 | 0.42 | 0.51 | 0.54 | 0.19 |
| NSC Region | N | - | 10 | 16 | 18 | 48 | - | - | 92 |
| | Mean | - | 4.20 | 5.81 | 5.22 | 4.23 | - | - | 4.70 |
| | Median | - | 3.5 | 4 | 4 | 3 | - | - | 4 |
| | Std. Deviation | - | 2.78 | 3.94 | 3.61 | 4.53 | - | - | 4.09 |
| | Std. Error of Mean | - | 0.88 | 0.98 | 0.85 | 0.65 | - | - | 0.43 |
| Total | N | 4 | 32 | 62 | 70 | 83 | 18 | 21 | 290 |
| | Mean | 1.00 | 3.00 | 3.73 | 3.91 | 3.51 | 1.83 | 2.57 | 3.39 |
| | Median | 1 | 3 | 3 | 3 | 3 | 1 | 2 | 3 |
| | Std. Deviation | 1.15 | 2.18 | 3.16 | 2.89 | 3.80 | 1.89 | 2.16 | 3.11 |
| | Std. Error of Mean | 0.58 | 0.39 | 0.40 | 0.35 | 0.42 | 0.44 | 0.47 | 0.18 |

**Table A2.8. Number of Private Boat Trips Only Involving Fishing on AR Sites by Recall Month and License Region (See Appendix 1.1, Mail Questionnaire, Question B3)**

| Mail Region | Recall Month | April | May | June | July | August | September | October | Total |
|---|---|---|---|---|---|---|---|---|---|
| SCC Region | N | 19 | 26 | 45 | 36 | 42 | 21 | 18 | 207 |
| | % of Total N | 9.2 | 12.6 | 21.7 | 17.4 | 20.3 | 10.1 | 8.7 | 100.0 |
| | Mean | 1.9 | 2.4 | 2.9 | 2.3 | 1.9 | 2.2 | 1.9 | 2.3 |
| | Median | 1 | 2 | 2 | 1.5 | 1 | 2 | 1.5 | 2 |
| | S.D | 1.6 | 2.5 | 2.6 | 2.0 | 1.4 | 1.7 | 1.3 | 2.0 |
| | S.E. | 0.4 | 0.5 | 0.4 | 0.3 | 0.2 | 0.4 | 0.3 | 0.1 |
| SCNC Region | N | - | 20 | 30 | 32 | 31 | 16 | 16 | 145 |
| | % of Total N | - | 13.8 | 20.7 | 22.1 | 21.4 | 11.0 | 11.0 | 100.0 |
| | Mean | - | 2.2 | 2.2 | 2.7 | 1.9 | 1.9 | 1.7 | 2.1 |
| | Median | - | 1.5 | 1 | 2 | 2 | 2 | 1 | 2 |
| | S. D. | - | 2.5 | 2.1 | 2.4 | 1.0 | 1.0 | 0.9 | 1.8 |
| | S. E. | - | 0.5 | 0.4 | 0.4 | 0.2 | 0.3 | 0.2 | 0.2 |
| NSC Region | N | - | 11 | 18 | 19 | 49 | - | - | 97 |
| | % of Total N | - | 11.3 | 18.6 | 19.6 | 50.5 | - | - | 100.0 |
| | Mean | - | 1.9 | 2.3 | 1.8 | 2.6 | - | - | 2.3 |
| | Median | | 1 | 2 | 1 | 2 | - | - | 2 |
| | S. D. | - | 1.5 | 2.1 | 1.2 | 2.3 | - | - | 2.0 |
| | S. E. | - | 0.5 | 0.5 | 0.3 | 0.3 | - | - | 0.2 |
| Total | N | 19 | 57 | 93 | 87 | 122 | 37 | 34 | 449 |
| | % of Total N | 4.2 | 12.7 | 20.7 | 19.4 | 27.2 | 8.2 | 7.6 | 100.0 |
| | Mean | 1.9 | 2.2 | 2.6 | 2.3 | 2.2 | 2.1 | 1.8 | 2.2 |
| | Median | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| | S. D. | 1.6 | 2.3 | 2.4 | 2.0 | 1.8 | 1.5 | 1.1 | 2.0 |
| | S. E. | 0.4 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 |

**Table A2.9. Number of Private Boat Fishing Trips in Creeks, Sounds, and Bays by Recall Month and License Region (See Appendix 1.1, Mail Questionnaire, Question A6a)**

| Mail Region | Recall Month | April | May | June | July | August | September | October | Total |
|---|---|---|---|---|---|---|---|---|---|
| SCC Region | N | 119 | 146 | 147 | 152 | 212 | 106 | 115 | 997 |
| | % of Total N | 11.9 | 14.6 | 14.7 | 15.2 | 21.3 | 10.6 | 11.5 | 100.0 |
| | Mean | 4.8 | 4.5 | 5.4 | 5.5 | 5.4 | 4.5 | 6.0 | 5.2 |
| | Median | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | S. D. | 5.9 | 6.9 | 7.1 | 7.5 | 8.6 | 4.8 | 8.1 | 7.3 |
| | S. E. | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 | 0.8 | 0.2 |
| SCNC Region | N | - | 86 | 95 | 118 | 137 | 62 | 71 | 569 |
| | % of Total N | - | 15.1 | 16.7 | 20.7 | 24.1 | 10.9 | 12.5 | 100.0 |
| | Mean | - | 2.9 | 4.1 | 3.3 | 3.6 | 3.7 | 4.0 | 3.6 |
| | Median | - | 2 | 3 | 2 | 2 | 2 | 2 | 2 |
| | S. D. | - | 2.9 | 4.3 | 3.2 | 3.7 | 4.1 | 3.7 | 3.7 |
| | S. E. | - | 0.3 | 0.4 | 0.3 | 0.3 | 0.5 | 0.4 | 0.2 |
| NSC Region | N | - | 71 | 69 | 79 | 199 | - | - | 418 |
| | % of Total N | - | 17.0 | 16.5 | 18.9 | 47.6 | - | - | 100.0 |
| | Mean | - | 4.7 | 3.3 | 4.5 | 4.8 | - | - | 4.5 |
| | Median | | 3 | 2 | 3 | 3 | - | - | 3 |
| | S. D. | - | 5.2 | 2.6 | 5.0 | 6.4 | - | - | 5.5 |
| | S.E. | - | 0.6 | 0.3 | 0.6 | 0.5 | - | - | 0.3 |
| Total | N | 119 | 303 | 311 | 349 | 548 | 168 | 186 | 1984 |
| | % of Total N | 6.0 | 15.3 | 15.7 | 17.6 | 27.6 | 8.5 | 9.4 | 100.0 |
| | Mean | 4.8 | 4.1 | 4.5 | 4.5 | 4.7 | 4.2 | 5.2 | 4.6 |
| | Median | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| | S. D. | 5.9 | 5.6 | 5.6 | 5.9 | 6.9 | 4.5 | 6.8 | 6.1 |
| | S. E. | 0.5 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.5 | 0.1 |

**Table A2.10 Number of Private Boat Fishing Trips Nearshore by Recall Month and License Region (See Question A6b)**

| Mail Region | Recall Month | April | May | June | July | August | September | October | Total |
|---|---|---|---|---|---|---|---|---|---|
| SCC Region | N | 50 | 68 | 86 | 84 | 120 | 59 | 57 | 524 |
| | % of Total N | 9.5 | 13.0 | 16.4 | 16.0 | 22.9 | 11.3 | 10.9 | 100.0 |
| | Mean | 4.0 | 2.6 | 3.2 | 3.2 | 3.2 | 2.6 | 4.4 | 3.3 |
| | Median | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | S. D. | 5.7 | 2.4 | 2.9 | 2.9 | 5.1 | 2.0 | 5.3 | 4.0 |
| | S.E. | 0.8 | 0.3 | 0.3 | 0.3 | 0.5 | 0.3 | 0.7 | 0.2 |
| SCNC Region | N | - | 50 | 58 | 83 | 85 | 35 | 36 | 347 |
| | % of Total N | - | 14.4 | 16.7 | 23.9 | 24.5 | 10.1 | 10.4 | 100.0 |
| | Mean | - | 2.7 | 3.2 | 2.9 | 2.9 | 2.7 | 3.1 | 2.9 |
| | Median | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | Std. Deviation | - | 2.3 | 3.7 | 2.7 | 2.9 | 2.7 | 3.6 | 3.0 |
| | S.E. | - | 0.3 | 0.5 | 0.3 | 0.3 | 0.4 | 0.6 | 0.2 |
| NSC Region | N | - | 31 | 45 | 51 | 125 | - | - | 252 |
| | % of Total N | - | 12.3 | 17.9 | 20.2 | 49.6 | - | - | 100.0 |
| | Mean | - | 2.9 | 2.4 | 2.8 | 2.8 | - | - | 2.7 |
| | Median | | 2 | 2 | 2 | 2 | - | - | 2 |
| | S.D. | - | 2.1 | 1.7 | 3.1 | 2.6 | - | - | 2.5 |
| | S.E. | - | 0.4 | 0.3 | 0.4 | 0.2 | - | - | 0.2 |
| Total | N | 37 | 113 | 145 | 156 | 225 | 57 | 61 | 794 |
| | % of Total N | 4.7 | 14.2 | 18.3 | 19.6 | 28.3 | 7.2 | 7.7 | 100.0 |
| | Mean | 2.6 | 2.6 | 3.7 | 2.9 | 3.0 | 2.7 | 2.2 | 2.9 |
| | Median | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| | S.D. | 2.6 | 2.3 | 4.0 | 2.5 | 2.7 | 3.1 | 2.3 | 2.9 |
| | S.E. | 0.4 | 0.2 | 0.3 | 0.2 | 0.2 | 0.4 | 0.3 | 0.1 |

**Table A2.11. Number of Private Boat Fishing Trips Offshore by Recall Month and License Region (See Question A6c)**

| Mail Region | Recall Month | April | May | June | July | August | September | October | Total |
|---|---|---|---|---|---|---|---|---|---|
| SCC Region | N | 37 | 47 | 72 | 62 | 74 | 37 | 35 | 364 |
| | % of Total N | 10.2 | 12.9 | 19.8 | 17.0 | 20.3 | 10.2 | 9.6 | 100.0 |
| | Mean | 2.6 | 2.4 | 4.1 | 3.1 | 2.8 | 3.2 | 2.5 | 3.0 |
| | Median | 1 | 2 | 3 | 2 | 2 | 2 | 1 | 2 |
| | S.D. | 2.6 | 1.8 | 4.4 | 2.4 | 3.0 | 3.7 | 2.7 | 3.2 |
| | S.E. | 0.4 | 0.3 | 0.5 | 0.3 | 0.3 | 0.6 | 0.5 | 0.2 |
| SCNC Region | N | - | 45 | 54 | 63 | 65 | 20 | 26 | 273 |
| | % of Total N | - | 16.5 | 19.8 | 23.1 | 23.8 | 7.3 | 9.5 | 100.0 |
| | Mean | - | 2.8 | 3.2 | 2.8 | 3.0 | 1.8 | 1.8 | 2.8 |
| | Median | - | 2 | 2 | 2 | 2 | 1 | 1 | 2 |
| | S.D. | - | 3.0 | 3.3 | 2.4 | 2.6 | 1.2 | 1.5 | 2.7 |
| | S.E. | - | 0.4 | 0.5 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 |
| NSC Region | N | - | 21 | 19 | 31 | 86 | - | - | 157 |
| | % of Total N | - | 13.4 | 12.1 | 19.7 | 54.8 | - | - | 100.0 |
| | Mean | - | 2.5 | 3.6 | 2.8 | 3.2 | - | - | 3.1 |
| | Median | | 2 | 2 | 2 | 2 | - | - | 2 |
| | S.D. | - | 1.7 | 3.8 | 2.9 | 2.7 | - | - | 2.8 |
| | S.E. | - | 0.4 | 0.9 | 0.5 | 0.3 | - | - | 0.2 |
| Total | N | 131 | 352 | 382 | 415 | 645 | 192 | 204 | 2321 |
| | % of Total N | 5.6 | 15.2 | 16.5 | 17.9 | 27.8 | 8.3 | 8.8 | 100.0 |
| | Mean | 6.6 | 5.5 | 6.6 | 6.5 | 6.6 | 5.8 | 7.2 | 6.4 |
| | Median | 4 | 3.5 | 4 | 4 | 4 | 4 | 4 | 4 |
| | S.D. | 9.1 | 6.3 | 8.0 | 7.6 | 8.6 | 6.1 | 10.3 | 8.0 |
| | S.E. | 0.8 | 0.3 | 0.4 | 0.4 | 0.3 | 0.4 | 0.7 | 0.2 |

**Table A2.12. Number of Private Boat Fishing Trips (Sum of Responses to Questions A6a, A6b and A6c) by Recall Month and License Region. (Note: Individual trips to a given area may have occurred on the same day.)**

| Mail Region | Recall Month | April | May | June | July | August | September | October | Total |
|---|---|---|---|---|---|---|---|---|---|
| SCC Region | N | 131 | 162 | 176 | 172 | 244 | 116 | 124 | 1125 |
| | % of Total N | 11.6 | 14.4 | 15.6 | 15.3 | 21.7 | 10.3 | 11.0 | 100.0 |
| | Mean | 6.6 | 5.8 | 7.8 | 7.5 | 7.1 | 6.4 | 8.3 | 7.1 |
| | Median | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| | S.D. | 9.1 | 7.2 | 9.5 | 9.3 | 10.3 | 6.8 | 12.0 | 9.4 |
| | S.E. | 0.8 | 0.6 | 0.7 | 0.7 | 0.7 | 0.6 | 1.1 | 0.3 |
| SCNC Region | N | - | 109 | 120 | 144 | 160 | 76 | 80 | 689 |
| | % of Total N | - | 15.8 | 17.4 | 20.9 | 23.2 | 11.0 | 11.6 | 100.0 |
| | Mean | - | 4.7 | 6.3 | 5.7 | 5.8 | 4.8 | 5.5 | 5.5 |
| | Median | - | 3 | 4 | 4 | 4 | 3 | 3 | 4 |
| | S.D. | - | 4.9 | 7.4 | 5.4 | 6.3 | 4.9 | 6.5 | 6.0 |
| | S.E. | - | 0.5 | 0.7 | 0.4 | 0.5 | 0.6 | 0.7 | 0.2 |
| NSC Region | N | - | 81 | 86 | 99 | 241 | - | - | 507 |
| | % of Total N | - | 16.0 | 17.0 | 19.5 | 47.5 | - | - | 100.0 |
| | Mean | - | 5.9 | 4.7 | 5.9 | 6.5 | - | - | 6.0 |
| | Median | | 4 | 4 | 3 | 4 | - | - | 4 |
| | S.D. | - | 6.1 | 4.4 | 6.7 | 7.9 | - | - | 6.9 |
| | S.E. | - | 0.7 | 0.5 | 0.7 | 0.5 | - | - | 0.3 |
| Total | N | 131 | 162 | 176 | 172 | 244 | 116 | 124 | 1125 |
| | % of Total N | 11.6 | 14.4 | 15.6 | 15.3 | 21.7 | 10.3 | 11.0 | 100.0 |
| | Mean | 6.6 | 5.8 | 7.8 | 7.5 | 7.1 | 6.4 | 8.3 | 7.1 |
| | Median | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| | S.D. | 9.1 | 7.2 | 9.5 | 9.3 | 10.3 | 6.8 | 12.0 | 9.4 |
| | S.E. | 0.8 | 0.6 | 0.7 | 0.7 | 0.7 | 0.6 | 1.1 | 0.3 |

**Table A3.1. Estimated Total Number of Artificial Reef (AR) Related Fishing Trips by SC Private Boat Anglers During 2006 Based on Monthly Responses of SC Saltwater Recreational Fishing Licensees[1] and the FYO6 License Population (Records) Sampled (See Table A1).**

| Region | Licenses | Percent |
|---|---|---|
| SCC | 60,986 | 59.5% |
| SCNC | 21,913 | 21.4% |
| NSC | 19,541 | 19.1% |
| **Totals** | **102,440** | **100.0%** |

**SCC: SC Coastal License Region**
**SCNC: SC Non-Coastal License Region**
**NSC: Non-Resident License Region (Out of State)**

**Percentages of AR Related Fishing Trips in Given Month and Region Used to Estimate Monthly AR Trips by Licensees During 2006 (See Table 2.5 and report text):**

| Region | March | April | May | June[2] | July | Aug | Sept | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|
| SCC | 8% | 8% | 10% | 16% | 16% | 16% | 13% | 13% | 8% | 8% |
| SCNC | 6% | 6% | 6% | 9% | 9% | 9% | 10% | 10% | 6% | 6% |
| NSC | 6% | 6% | 6% | 10% | 10% | 10% | 6% | 6% | 6% | 6% |

**Estimated Total Licensees Completing One or More AR Trips by Month and Region Based on Total Population of Licensees Sampled:**

| Region | March | April | May | June | July | Aug | Sept | Oct | Nov | Dec | Annual Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SCC | 4,879 | 4,879 | 6,099 | 9,758 | 9,758 | 9,758 | 7,928 | 7,928 | 4,879 | 4,879 | 70,744 |
| SCNC | 1,315 | 1,315 | 1,315 | 1,972 | 1,972 | 1,972 | 2,191 | 2,191 | 1,315 | 1,315 | 16,873 |
| NSC | 1,172 | 1,172 | 1,172 | 1,954 | 1,954 | 1,954 | 1,172 | 1,172 | 1,172 | 1,172 | 14,070 |
| Totals | 7,366 | 7,366 | 8,586 | 13,684 | 13,684 | 13,684 | 11,292 | 11,292 | 7,366 | 7,366 | **101,686** |

**Estimated Total AR Trips by Month and Region Based On Two Trips Per Licensee:**

| Region | March | April | May | June | July | Aug | Sept | Oct | Nov | Dec | Annual Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SCC | 9,758 | 9,758 | 12,197 | 19,516 | 19,516 | 19,516 | 15,856 | 15,856 | 9,758 | 9,758 | 141,488 |
| SCNC | 2,630 | 2,630 | 2,630 | 3,944 | 3,944 | 3,944 | 4,383 | 4,383 | 2,630 | 2,630 | 33,746 |
| NSC | 2,345 | 2,345 | 2,345 | 3,908 | 3,908 | 3,908 | 2,345 | 2,345 | 2,345 | 2,345 | 28,139 |
| Totals | 14,732 | 14,732 | 17,172 | 27,368 | 27,368 | 27,368 | 22,584 | 22,584 | 14,732 | 14,732 | **203,373** |

**Percentage of Total Estimated AR Trips by Month and Region:**

| Region | March | April | May | June | July | Aug | Sept | Oct | Nov | Dec | Region Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SCC | 4.8% | 4.8% | 6.0% | 9.6% | 9.6% | 9.6% | 7.8% | 7.8% | 4.8% | 4.8% | 69.6% |
| SCNC | 1.3% | 1.3% | 1.3% | 1.9% | 1.9% | 1.9% | 2.2% | 2.2% | 1.3% | 1.3% | 16.6% |
| NSC | 1.2% | 1.2% | 1.2% | 1.9% | 1.9% | 1.9% | 1.2% | 1.2% | 1.2% | 1.2% | 13.8% |
| **Totals** | **7.2%** | **7.2%** | **8.4%** | **13.5%** | **13.5%** | **13.5%** | **11.1%** | **11.1%** | **7.2%** | **7.2%** | **100.0%** |

[1]**It was assumed that artificial reef trips were insignificant during the months of January and February (See text).**
[2]**Percentages used for the summer months (i.e. June-August) were rounded three-months averages for these months.**

**Table A4.1. Count of Gender and Residency Status, and Mean Ages of Responding Intercepted South Carolina Charter Divers during 2006.**

**Counts by Gender and Residency:**

| Diver Gender | SC Residents: | | | SC Coastal County Residents: | | |
|---|---|---|---|---|---|---|
| | **No** | **Yes** | **Total** | **No** | **Yes** | **Total** |
| **Female:** | 22 | 6 | 28 | 24 | 4 | 28 |
| Row % | 78.6% | 21.4% | 100.0% | 85.7% | 14.3% | 100.0% |
| Total %[1] | 21.6% | 5.9% | 27.5% | 23.5% | 3.9% | 27.5% |
| **Male:** | 51 | 23 | 74 | 55 | 19 | 74 |
| Row % | 68.9% | 31.1% | 100.0% | 74.3% | 25.7% | 100.0% |
| Total % | 50.0% | 22.5% | 72.5% | 53.9% | 18.6% | 72.5% |
| **Totals:** | 73 | 29 | 102 | 79 | 23 | 102 |
| **Row %** | **71.6%** | **28.4%** | **100.0%** | **77.5%** | **22.5%** | **100.0%** |

[1]Percentage of all counts within each group, i.e. "SC Resident" and "SC Coastal County Resident."

**Means of Diver Ages by Gender and Residency**

| Diver Gender | SC Resident? | Mean Age | N | Std. Deviation |
|---|---|---|---|---|
| **Female:** | **No** | 32.7 | 21 | 13.785 |
| | **Yes** | 28.0 | 5 | 16.628 |
| | **Total*** | 31.8 | 26 | 14.135 |
| **Male:** | **No** | 37.3 | 49 | 12.866 |
| | **Yes** | 39.0 | 22 | 13.985 |
| | **Total*** | 37.9 | 71 | 13.145 |
| **Combined:** | **No** | 35.9 | 70 | 13.225 |
| | **Yes** | 37.0 | 27 | 14.819 |
| | **Total** | 36.2 | 97 | 13.617 |

***ANOVA Results**

| One-Way ANOVA Groups | | | Sum of Squares | df | Mean Square | F** |
|---|---|---|---|---|---|---|
| **Age vs. Gender** | **Between Groups** | (Combined) | 709.07185 | 1 | 709.0719 | **3.94148** |
| | **Within Groups** | | 17090.475 | 95 | 179.8997 | |
| | **Total** | | 17799.546 | 96 | | |

** Significant at the 5% level.

**Table A5.1 Means of Trip Expenditure Categories of Private Boat Anglers Fishing at Sites within the South Carolina Artificial Reef System during April-October 2006 based on Responses from Random Samples of SC Saltwater Recreational License Holders**

| License Region | Stayed Overnight? | | Bait | Ice | Boat Fuel & Oil | Other Fees | Fishing Tackle | Ramp Fees | Parking Fees | Restaurants | Food Retail Stores | Daily Lodging | Auto/Truck Fuel | Other Misc. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SCC** | **Yes** | Mean | 23.19 | 10.89 | 141.07 | 55.00 | 34.44 | 2.00 | 9.63 | 75.93 | 30.74 | 36.87 | 34.48 | 3.70 |
| | | N | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 26 | 27 | 27 |
| | | SE[1] | 6.37 | 2.22 | 26.61 | 33.69 | 11.89 | 0.98 | 6.28 | 19.27 | 5.68 | 14.31 | 8.15 | 3.70 |
| | **No** | Mean | 15.48 | 9.75 | 84.92 | 14.97 | 25.35 | 19.70 | 3.70 | 31.74 | 26.27 | 0 | 17.96 | 5.09 |
| | | N | 199 | 199 | 199 | 199 | 199 | 199 | 199 | 199 | 199 | 182 | 199 | 199 |
| | | SE | 1.80 | 1.54 | 12.06 | 6.52 | 5.78 | 18.11 | 2.48 | 13.13 | 5.44 | 0 | 2.87 | 2.32 |
| | **Total:** | Mean | 16.40 | 9.89 | 91.63 | 19.75 | 26.43 | 17.58 | 4.41 | 37.02 | 26.81 | 4.61 | 19.93 | 4.92 |
| | | N | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 226 | 208 | 226 | 226 |
| | | SE | 1.76 | 1.38 | 11.14 | 7.03 | 5.28 | 15.95 | 2.31 | 11.82 | 4.84 | 1.95 | 2.72 | 2.09 |
| **SC N-C*** | **Yes** | Mean | 29.36 | 14.48 | 162.11 | 34.62 | 36.61 | 4.01 | 9.08 | 97.24 | 48.34 | 34.10 | 75.13 | 2.90 |
| | | N | 184 | 184 | 184 | 184 | 184 | 184 | 184 | 184 | 184 | 182 | 184 | 184 |
| | | SE | 4.54 | 1.28 | 36.53 | 16.70 | 5.91 | 1.32 | 3.10 | 9.06 | 4.88 | 6.10 | 7.57 | 1.60 |
| | **No** | Mean | 22.16 | 8.46 | 103.73 | 13.05 | 20.01 | 2.77 | 5.67 | 26.72 | 18.54 | 0.00 | 50.00 | 6.40 |
| | | N | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 71 | 82 | 82 |
| | | SE | 4.66 | 1.51 | 21.21 | 12.20 | 4.59 | 1.31 | 3.47 | 4.94 | 2.49 | 0.00 | 18.39 | 3.93 |
| | **Total:** | Mean | 27.14 | 12.62 | 144.11 | 27.97 | 31.49 | 3.62 | 8.03 | 75.50 | 39.15 | 24.53 | 67.38 | 3.98 |
| | | N | 266 | 266 | 266 | 266 | 266 | 266 | 266 | 266 | 266 | 253.00 | 266 | 266 |
| | | SE | 3.45 | 1.01 | 26.13 | 12.15 | 4.35 | 1.00 | 2.40 | 6.75 | 3.56 | 4.49 | 7.73 | 1.64 |
| **ALL** | **Yes** | Mean | 28.57 | 14.02 | 159.42 | 37.23 | 36.33 | 3.75 | 9.15 | 94.51 | 46.09 | 34.45 | 69.92 | 3.00 |
| | | N | 211 | 211 | 211 | 211 | 211 | 211 | 211 | 211 | 211 | 208 | 211 | 211 |
| | | SE | 4.04 | 1.15 | 32.02 | 15.17 | 5.37 | 1.16 | 2.82 | 8.28 | 4.34 | 5.62 | 6.74 | 1.47 |
| | **No** | Mean | 17.43 | 9.38 | 90.41 | 14.41 | 23.79 | 14.76 | 4.28 | 30.27 | 24.01 | 0.00 | 27.31 | 5.47 |
| | | N | 281 | 281 | 281 | 281 | 281 | 281 | 281 | 281 | 281 | 253 | 281 | 281 |
| | | SE | 1.87 | 1.18 | 10.54 | 5.82 | 4.30 | 12.83 | 2.03 | 9.40 | 3.92 | 0.00 | 5.78 | 2.00 |
| | **Grand Total** | Mean | 22.21 | 11.37 | 120.00 | 24.20 | 29.17 | 10.04 | 6.37 | 57.82 | 33.48 | 15.54 | 45.59 | 4.41 |
| | | N | 492 | 492 | 492 | 492 | 492 | 492 | 492 | 492 | 492 | 461 | 492 | 492 |
| | | SE | 2.05 | 0.84 | 15.06 | 7.31 | 3.38 | 7.34 | 1.67 | 6.59 | 2.95 | 2.66 | 4.49 | 1.30 |

**1-Standard error of the mean.**

*SC N-C: Pooled expenditures of SCNC and NSC AR anglers.

**Appendix 3: Summary of Responses by SC Artificial Reef Permitted Area (See Appendix 1.1, Mail Questionnaire, Question B4). Note: Response data has been standardized to responses per 1,000 anglers.**

**Appendix 3:** Description of Site Abbreviations Used in the Following Appendix Tables A3.1 through A3.3 and Appendix Figures A3.1 through Fig. A3.4.

| Site Abbreviation | Site Description |
|---|---|
| PA01Jim | PA-01, Jim Caudle Reef |
| PA01Lit | PA-01, Little River Reef |
| PA02Off | PA-02, Little River Offshore Reef |
| PA02Bar | PA-02, Barracuda Alley |
| PA03Will | PA-03, Will Goldfinch Reef |
| PA06BP | PA-06, BP-25 Reef |
| PA08Bill | PA-08, Bill Perry Jr. Reef |
| PA09Para | PA-09, Paradise Reef |
| PA09HP | PA-09, H.P. Springs Jr. Reef |
| PA09Grad | PA-09, Grand Strand SW Anglers |
| PA10TenM | PA-10**,** Ten Mile Reef |
| PA10EleM | PA-10**,** Eleven Mile Reef |
| PA10Brue | PA-10**,** Bruce Rush Reef |
| PA11Paw | PA-11, Pawleys Island Reef |
| PA12Nor | PA-12, North Inlet Reef |
| PA13Way | PA-13, Wayne Upchurch Reef |
| PA14Geo | PA-14, Georgetown Reef |
| PA15Near | PA-15, Georgetown Nearshore |
| PA15Capt | PA-15, Capt. Sam Crayton Reef |
| PA16CJ | PA-16, C.J. Davidson Jr Reef |
| PA17Verm | PA-17, Vermillion Reef |
| PA18Gree | PA-18, Greenville Reef |
| PA18Ralp | PA-18, Ralph H. Skelton Reef |
| PA19Cape | PA-19, Cape Romain Reef |
| PA20Hect | PA-20, Hector Reef |
| PA22Capr | PA-22, Capers Reef |
| PA22R8 | PA-22, R8 |
| PA23Y73 | PA-23, Y-73 Reef |
| PA24C60 | PA-24, Charleston 60' Reef |
| PA25Near | PA-25, Charleston Nearshore Reef |
| PA25AirF | PA-25, Air Force Reef |
| PA25Coas | PA-25, Charleston Coastal |
| PA25Comm | PA-25, Anglers Charleston Community Reef |
| PA26Foly | PA-26, Folly Beach Fishing Pier |
| PA27Coma | PA-27, Comanche Reef |
| PA27Doug | PA-27, Doug Mellichamp Jr. Reef |
| PA28LowC | PA-28, Lowcountry Anglers' Reef |
| PA29Kiaw | PA-29, Kiawah Reef |
| PA294KI | PA-29, 4KI |
| PA30Ed60 | PA-30, Edisto 60' Reef |
| PA31Ed40 | PA-31, Edisto 40' Reef |
| PA32Edis | PA-32, N. Edisto Nearshore Reef |

| Appendix 3 (Continued) | |
|---|---|
| Site Abbreviation | Site Description |
| PA34CCA | PA-34, CCA-McClellanville Reef |
| PA34Jimm | PA-34, Jimmy Leland Reef |
| PA36Edis | PA-36, Edisto Offshore Reef |
| PA38Frip | PA-38, Fripp Island Reef |
| PA39Hunt | PA-39, Hunting Isl. State Park Pier |
| PA40Hunt | PA-40, Hunting Island Reef |
| PA406HI | PA-40, 6HI |
| PA41Gord | PA-41, General Gordon Reef |
| PA42Beau | PA-42, Beaufort 45' Reef |
| PA43Parr | PA-43, Parris Island Reef |
| PA44Bets | PA-44, Betsy Ross Reef |
| PA45Fish | PA-45, Fish America Reef |
| PA47Whit | PA-47, White Water Reef |
| PA48Eagl | PA-48, Eagle's Nest Reef |
| PA49Hilt | PA-49, Hilton Head Reef |
| PA49Tire | PA-49, Tire Reef |
| IS01Up | IS-01, Upper Winyah Bay Inshore |
| IS02Low | IS-02, Lower Winyah Bay Inshore |
| IS03StHe | IS-03, St. Helena Sound Inshore |
| IS04Ston | IS-04, Stono River Inshore Reef |

**Appendix 3.1:** Numbers of Visitors and Number of Visitors per 1,000 Anglers by AR Reef and Recall Month

| Site Name | April | | May | | June | | July | | August | | September | | October | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PA01Jim | 0 | 0.0 | 2 | 1.8 | 6 | 5.4 | 6 | 5.4 | 25 | 16.1 | 3 | 6.3 | 3 | 6.1 | 45 | 7.3 |
| PA01Lit | 1 | 2.8 | 8 | 7.3 | 11 | 10.0 | 9 | 8.0 | 23 | 14.8 | 5 | 10.4 | 2 | 4.1 | 59 | 9.5 |
| PA02Off | 1 | 2.8 | 8 | 7.3 | 9 | 8.2 | 11 | 9.8 | 21 | 13.5 | 4 | 8.4 | 1 | 2.0 | 55 | 8.9 |
| PA02Bar | 0 | 0.0 | 1 | 0.9 | 1 | 0.9 | 0 | 0.0 | 1 | 0.6 | 0 | 0.0 | 0 | 0.0 | 3 | 0.5 |
| PA03Will | 1 | 2.8 | 1 | 0.9 | 2 | 1.8 | 2 | 1.8 | 2 | 1.3 | 0 | 0.0 | 2 | 4.1 | 10 | 1.6 |
| PA06BP | 0 | 0.0 | 4 | 3.6 | 6 | 5.4 | 7 | 6.3 | 7 | 4.5 | 1 | 2.1 | 3 | 6.1 | 28 | 4.5 |
| PA08Bill | 1 | 2.8 | 1 | 0.9 | 7 | 6.4 | 6 | 5.4 | 8 | 5.2 | 1 | 2.1 | 3 | 6.1 | 27 | 4.4 |
| PA09Para | 4 | 11.3 | 12 | 10.9 | 16 | 14.5 | 14 | 12.5 | 15 | 9.7 | 5 | 10.4 | 7 | 14.3 | 73 | 11.8 |
| PA09HP | 0 | 0.0 | 1 | 0.9 | 3 | 2.7 | 3 | 2.7 | 2 | 1.3 | 1 | 2.1 | 0 | 0.0 | 10 | 1.6 |
| PA09Grad | 2 | 5.6 | 2 | 1.8 | 1 | 0.9 | 4 | 3.6 | 2 | 1.3 | 0 | 0.0 | 0 | 0.0 | 11 | 1.8 |
| PA10TenM | 2 | 5.6 | 7 | 6.4 | 11 | 10.0 | 12 | 10.7 | 18 | 11.6 | 8 | 16.7 | 4 | 8.1 | 62 | 10.0 |
| PA10EleM | 0 | 0.0 | 2 | 1.8 | 2 | 1.8 | 5 | 4.5 | 5 | 3.2 | 1 | 2.1 | 1 | 2.0 | 16 | 2.6 |
| PA10Brue | 0 | 0.0 | 0 | 0.0 | 1 | 0.9 | 2 | 1.8 | 1 | 0.6 | 0 | 0.0 | 0 | 0.0 | 4 | 0.6 |
| PA11Paw | 1 | 2.8 | 5 | 4.5 | 9 | 8.2 | 6 | 5.4 | 8 | 5.2 | 5 | 10.4 | 4 | 8.1 | 38 | 6.1 |
| PA12Nor | 1 | 2.8 | 2 | 1.8 | 5 | 4.5 | 0 | 0.0 | 8 | 5.2 | 0 | 0.0 | 2 | 4.1 | 18 | 2.9 |
| PA13Way | 1 | 2.8 | 0 | 0.0 | 1 | 0.9 | 1 | 0.9 | 1 | 0.6 | 0 | 0.0 | 0 | 0.0 | 4 | 0.6 |
| PA14Geo | 1 | 2.8 | 7 | 6.4 | 5 | 4.5 | 7 | 6.3 | 10 | 6.5 | 3 | 6.3 | 6 | 12.2 | 39 | 6.3 |
| PA15Near | 1 | 2.8 | 6 | 5.4 | 10 | 9.1 | 11 | 9.8 | 14 | 9.0 | 5 | 10.4 | 4 | 8.1 | 51 | 8.2 |
| PA15Capt | 0 | 0.0 | 2 | 1.8 | 0 | 0.0 | 1 | 0.9 | 2 | 1.3 | 0 | 0.0 | 0 | 0.0 | 5 | 0.8 |
| PA16CJ | 2 | 5.6 | 3 | 2.7 | 3 | 2.7 | 2 | 1.8 | 1 | 0.6 | 0 | 0.0 | 0 | 0.0 | 11 | 1.8 |
| PA17Verm | 2 | 5.6 | 3 | 2.7 | 10 | 9.1 | 5 | 4.5 | 7 | 4.5 | 4 | 8.4 | 1 | 2.0 | 32 | 5.2 |
| PA18Gree | 1 | 2.8 | 1 | 0.9 | 7 | 6.4 | 3 | 2.7 | 3 | 1.9 | 1 | 2.1 | 0 | 0.0 | 16 | 2.6 |
| PA18Ralp | 0 | 0.0 | 0 | 0.0 | 1 | 0.9 | 1 | 0.9 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.3 |
| PA19Cape | 0 | 0.0 | 0 | 0.0 | 4 | 3.6 | 7 | 6.3 | 4 | 2.6 | 0 | 0.0 | 1 | 2.0 | 16 | 2.6 |
| PA20Hect | 0 | 0.0 | 3 | 2.7 | 3 | 2.7 | 1 | 0.9 | 3 | 1.9 | 0 | 0.0 | 0 | 0.0 | 10 | 1.6 |
| PA22Capr | 4 | 11.3 | 8 | 7.3 | 3 | 2.7 | 7 | 6.3 | 7 | 4.5 | 2 | 4.2 | 2 | 4.1 | 33 | 5.3 |
| PA22R8 | 3 | 8.5 | 5 | 4.5 | 5 | 4.5 | 3 | 2.7 | 3 | 1.9 | 1 | 2.1 | 0 | 0.0 | 20 | 3.2 |
| PA23Y73 | 2 | 5.6 | 4 | 3.6 | 3 | 2.7 | 10 | 8.9 | 5 | 3.2 | 2 | 4.2 | 2 | 4.1 | 28 | 4.5 |
| PA24C60 | 2 | 5.6 | 11 | 10.0 | 9 | 8.2 | 19 | 17.0 | 14 | 9.0 | 5 | 10.4 | 6 | 12.2 | 66 | 10.7 |
| PA25Near | 1 | 2.8 | 7 | 6.4 | 13 | 11.8 | 16 | 14.3 | 12 | 7.7 | 2 | 4.2 | 6 | 12.2 | 57 | 9.2 |
| PA25AirF | 0 | 0.0 | 0 | 0.0 | 2 | 1.8 | 2 | 1.8 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 0.6 |
| PA25Coas | 0 | 0.0 | 1 | 0.9 | 2 | 1.8 | 4 | 3.6 | 1 | 0.6 | 1 | 2.1 | 2 | 4.1 | 11 | 1.8 |
| PA25Comm | 1 | 2.8 | 0 | 0.0 | 1 | 0.9 | 2 | 1.8 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 0.6 |
| PA26Foly | 1 | 2.8 | 3 | 2.7 | 0 | 0.0 | 2 | 1.8 | 4 | 2.6 | 1 | 2.1 | 3 | 6.1 | 14 | 2.3 |
| PA27Coma | 3 | 8.5 | 7 | 6.4 | 3 | 2.7 | 10 | 8.9 | 9 | 5.8 | 5 | 10.4 | 2 | 4.1 | 39 | 6.3 |
| PA27Doug | 0 | 0.0 | 1 | 0.9 | 0 | 0.0 | 1 | 0.9 | 1 | 0.6 | 0 | 0.0 | 0 | 0.0 | 3 | 0.5 |
| PA28LowC | 1 | 2.8 | 0 | 0.0 | 2 | 1.8 | 7 | 6.3 | 5 | 3.2 | 1 | 2.1 | 3 | 6.1 | 19 | 3.1 |
| PA29Kiaw | 1 | 2.8 | 2 | 1.8 | 6 | 5.4 | 2 | 1.8 | 4 | 2.6 | 1 | 2.1 | 0 | 0.0 | 16 | 2.6 |
| PA294KI | 1 | 2.8 | 3 | 2.7 | 4 | 3.6 | 3 | 2.7 | 3 | 1.9 | 0 | 0.0 | 1 | 2.0 | 15 | 2.4 |
| PA30Ed60 | 3 | 8.5 | 4 | 3.6 | 7 | 6.4 | 12 | 10.7 | 12 | 7.7 | 2 | 4.2 | 3 | 6.1 | 43 | 6.9 |
| PA31Ed40 | 0 | 0.0 | 2 | 1.8 | 12 | 10.9 | 11 | 9.8 | 14 | 9.0 | 1 | 2.1 | 2 | 4.1 | 42 | 6.8 |
| PA32Edis | 2 | 5.6 | 3 | 2.7 | 1 | 0.9 | 3 | 2.7 | 7 | 4.5 | 3 | 6.3 | 3 | 6.1 | 22 | 3.6 |
| PA34CCA | 1 | 2.8 | 0 | 0.0 | 0 | 0.0 | 2 | 1.8 | 1 | 0.6 | 0 | 0.0 | 1 | 2.0 | 5 | 0.8 |
| PA34Jimm | 0 | 0.0 | 0 | 0.0 | 1 | 0.9 | 1 | 0.9 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.3 |
| PA36Edis | 0 | 0.0 | 0 | 0.0 | 3 | 2.7 | 4 | 3.6 | 14 | 9.0 | 1 | 2.1 | 2 | 4.1 | 24 | 3.9 |
| PA38Frip | 1 | 2.8 | 1 | 0.9 | 5 | 4.5 | 3 | 2.7 | 6 | 3.9 | 3 | 6.3 | 3 | 6.1 | 22 | 3.6 |

**Appendix 3.1:** Numbers of Visitors and Number of Visitors per 1,000 Anglers by AR Reef and Recall Month (Continue)

| Site Name | April | | May | | June | | July | | August | | September | | October | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PA39Hunt | 0 | 0.0 | 1 | 0.9 | 1 | 0.9 | 1 | 0.9 | 6 | 3.9 | 1 | 2.1 | 0 | 0.0 | 10 | 1.6 |
| PA40Hunt | 2 | 5.6 | 3 | 2.7 | 3 | 2.7 | 2 | 1.8 | 3 | 1.9 | 4 | 8.4 | 2 | 4.1 | 19 | 3.1 |
| PA406HI | 1 | 2.8 | 0 | 0.0 | 2 | 1.8 | 0 | 0.0 | 2 | 1.3 | 1 | 2.1 | 0 | 0.0 | 6 | 1.0 |
| PA41Gord | 1 | 2.8 | 4 | 3.6 | 5 | 4.5 | 8 | 7.1 | 6 | 3.9 | 3 | 6.3 | 3 | 6.1 | 30 | 4.8 |
| PA42Beau | 2 | 5.6 | 3 | 2.7 | 5 | 4.5 | 6 | 5.4 | 4 | 2.6 | 4 | 8.4 | 2 | 4.1 | 26 | 4.2 |
| PA43Parr | 1 | 2.8 | 5 | 4.5 | 5 | 4.5 | 7 | 6.3 | 12 | 7.7 | 1 | 2.1 | 1 | 2.0 | 32 | 5.2 |
| PA44Bets | 1 | 2.8 | 3 | 2.7 | 8 | 7.3 | 10 | 8.9 | 9 | 5.8 | 7 | 14.6 | 2 | 4.1 | 40 | 6.5 |
| PA45Fish | 1 | 2.8 | 2 | 1.8 | 3 | 2.7 | 3 | 2.7 | 2 | 1.3 | 0 | 0.0 | 3 | 6.1 | 14 | 2.3 |
| PA47Whit | 0 | 0.0 | 3 | 2.7 | 0 | 0.0 | 0 | 0.0 | 7 | 4.5 | 3 | 6.3 | 1 | 2.0 | 14 | 2.3 |
| PA48Eagl | 0 | 0.0 | 2 | 1.8 | 3 | 2.7 | 1 | 0.9 | 5 | 3.2 | 1 | 2.1 | 4 | 8.1 | 16 | 2.6 |
| PA49Hilt | 1 | 2.8 | 1 | 0.9 | 2 | 1.8 | 2 | 1.8 | 8 | 5.2 | 2 | 4.2 | 5 | 10.2 | 21 | 3.4 |
| PA49Tire | 0 | 0.0 | 2 | 1.8 | 1 | 0.9 | 2 | 1.8 | 7 | 4.5 | 0 | 0.0 | 1 | 2.0 | 13 | 2.1 |
| IS01Up | 3 | 8.5 | 5 | 4.5 | 9 | 8.2 | 5 | 4.5 | 5 | 3.2 | 6 | 12.5 | 4 | 8.1 | 37 | 6.0 |
| IS02Low | 4 | 11.3 | 5 | 4.5 | 5 | 4.5 | 3 | 2.7 | 6 | 3.9 | 5 | 10.4 | 2 | 4.1 | 30 | 4.8 |
| IS03StHe | 0 | 0.0 | 2 | 1.8 | 4 | 3.6 | 11 | 9.8 | 8 | 5.2 | 2 | 4.2 | 3 | 6.1 | 30 | 4.8 |
| IS04Ston | 1 | 2.8 | 1 | 0.9 | 3 | 2.7 | 5 | 4.5 | 4 | 2.6 | 1 | 2.1 | 4 | 8.1 | 19 | 3.1 |
| Total | 67 | 189.3 | 185 | 168.0 | 275 | 249.8 | 316 | 282.4 | 407 | 262.6 | 119 | 248.4 | 122 | 248.5 | 1491 | 240.7 |

**Appendix 3.2:** Numbers of AR Trips and Numbers of Trips per 1,000 Anglers by AR Reef and Recall Month

| Site Name | April | | May | | June | | July | | August | | September | | October | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PA01Jim | 0 | 0.0 | 3 | 2.7 | 14 | 12.7 | 15 | 13.4 | 51 | 32.9 | 7 | 14.6 | 9 | 18.3 | 99 | 16.0 |
| PA01Lit | 2 | 5.6 | 22 | 20.0 | 23 | 20.9 | 13 | 11.6 | 46 | 29.7 | 18 | 37.6 | 2 | 4.1 | 126 | 20.3 |
| PA02Off | 2 | 5.6 | 10 | 9.1 | 20 | 18.2 | 21 | 18.8 | 43 | 27.7 | 15 | 31.3 | 1 | 2.0 | 112 | 18.1 |
| PA02Bar | 0 | 0.0 | 1 | 0.9 | 1 | 0.9 | 0 | 0.0 | 2 | 1.3 | 0 | 0.0 | 0 | 0.0 | 4 | 0.6 |
| PA03Will | 1 | 2.8 | 1 | 0.9 | 4 | 3.6 | 6 | 5.4 | 3 | 1.9 | 0 | 0.0 | 4 | 8.1 | 19 | 3.1 |
| PA06BP | 0 | 0.0 | 4 | 3.6 | 9 | 8.2 | 8 | 7.1 | 14 | 9.0 | 1 | 2.1 | 7 | 14.3 | 43 | 6.9 |
| PA08Bill | 3 | 8.5 | 1 | 0.9 | 9 | 8.2 | 9 | 8.0 | 16 | 10.3 | 1 | 2.1 | 6 | 12.2 | 45 | 7.3 |
| PA09Para | 10 | 28.2 | 32 | 29.1 | 40 | 36.3 | 25 | 22.3 | 21 | 13.5 | 11 | 23.0 | 23 | 46.8 | 162 | 26.2 |
| PA09HP | 0 | 0.0 | 1 | 0.9 | 5 | 4.5 | 5 | 4.5 | 3 | 1.9 | 1 | 2.1 | 0 | 0.0 | 15 | 2.4 |
| PA09Grad | 3 | 8.5 | 8 | 7.3 | 1 | 0.9 | 8 | 7.1 | 5 | 3.2 | 0 | 0.0 | 0 | 0.0 | 25 | 4.0 |
| PA10TenM | 3 | 8.5 | 11 | 10.0 | 19 | 17.3 | 25 | 22.3 | 37 | 23.9 | 13 | 27.1 | 9 | 18.3 | 117 | 18.9 |
| PA10EleM | 0 | 0.0 | 3 | 2.7 | 3 | 2.7 | 12 | 10.7 | 9 | 5.8 | 2 | 4.2 | 2 | 4.1 | 31 | 5.0 |
| PA10Brue | 0 | 0.0 | 0 | 0.0 | 1 | 0.9 | 4 | 3.6 | 6 | 3.9 | 0 | 0.0 | 0 | 0.0 | 11 | 1.8 |
| PA11Paw | 1 | 2.8 | 5 | 4.5 | 20 | 18.2 | 11 | 9.8 | 15 | 9.7 | 7 | 14.6 | 7 | 14.3 | 66 | 10.7 |
| PA12Nor | 3 | 8.5 | 3 | 2.7 | 8 | 7.3 | 0 | 0.0 | 11 | 7.1 | 0 | 0.0 | 4 | 8.1 | 29 | 4.7 |
| PA13Way | 1 | 2.8 | 0 | 0.0 | 2 | 1.8 | 1 | 0.9 | 1 | 0.6 | 0 | 0.0 | 0 | 0.0 | 5 | 0.8 |
| PA14Geo | 1 | 2.8 | 9 | 8.2 | 8 | 7.3 | 16 | 14.3 | 18 | 11.6 | 4 | 8.4 | 10 | 20.4 | 66 | 10.7 |
| PA15Near | 1 | 2.8 | 6 | 5.4 | 17 | 15.4 | 15 | 13.4 | 25 | 16.1 | 5 | 10.4 | 8 | 16.3 | 77 | 12.4 |
| PA15Capt | 0 | 0.0 | 3 | 2.7 | 0 | 0.0 | 1 | 0.9 | 2 | 1.3 | 0 | 0.0 | 0 | 0.0 | 6 | 1.0 |
| PA16CJ | 3 | 8.5 | 4 | 3.6 | 4 | 3.6 | 2 | 1.8 | 1 | 0.6 | 0 | 0.0 | 0 | 0.0 | 14 | 2.3 |
| PA17Verm | 3 | 8.5 | 4 | 3.6 | 13 | 11.8 | 8 | 7.1 | 12 | 7.7 | 4 | 8.4 | 2 | 4.1 | 46 | 7.4 |
| PA18Gree | 3 | 8.5 | 1 | 0.9 | 10 | 9.1 | 6 | 5.4 | 5 | 3.2 | 2 | 4.2 | 0 | 0.0 | 27 | 4.4 |
| PA18Ralp | 0 | 0.0 | 0 | 0.0 | 1 | 0.9 | 3 | 2.7 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 0.6 |
| PA19Cape | 0 | 0.0 | 0 | 0.0 | 5 | 4.5 | 10 | 8.9 | 5 | 3.2 | 0 | 0.0 | 2 | 4.1 | 22 | 3.6 |
| PA20Hect | 0 | 0.0 | 3 | 2.7 | 3 | 2.7 | 1 | 0.9 | 7 | 4.5 | 0 | 0.0 | 0 | 0.0 | 14 | 2.3 |
| PA22Capr | 6 | 16.9 | 12 | 10.9 | 5 | 4.5 | 13 | 11.6 | 8 | 5.2 | 2 | 4.2 | 3 | 6.1 | 49 | 7.9 |
| PA22R8 | 6 | 16.9 | 7 | 6.4 | 9 | 8.2 | 5 | 4.5 | 5 | 3.2 | 1 | 2.1 | 0 | 0.0 | 33 | 5.3 |
| PA23Y73 | 3 | 8.5 | 8 | 7.3 | 3 | 2.7 | 14 | 12.5 | 11 | 7.1 | 3 | 6.3 | 3 | 6.1 | 45 | 7.3 |
| PA24C60 | 2 | 5.6 | 18 | 16.3 | 18 | 16.3 | 36 | 32.2 | 39 | 25.2 | 6 | 12.5 | 9 | 18.3 | 128 | 20.7 |
| PA25Near | 1 | 2.8 | 10 | 9.1 | 33 | 30.0 | 28 | 25.0 | 17 | 11.0 | 2 | 4.2 | 11 | 22.4 | 102 | 16.5 |
| PA25AirF | 0 | 0.0 | 0 | 0.0 | 3 | 2.7 | 7 | 6.3 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 10 | 1.6 |
| PA25Coas | 0 | 0.0 | 1 | 0.9 | 3 | 2.7 | 11 | 9.8 | 3 | 1.9 | 1 | 2.1 | 2 | 4.1 | 21 | 3.4 |
| PA25Comm | 2 | 5.6 | 0 | 0.0 | 2 | 1.8 | 7 | 6.3 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 11 | 1.8 |
| PA26Foly | 1 | 2.8 | 5 | 4.5 | 0 | 0.0 | 3 | 2.7 | 13 | 8.4 | 2 | 4.2 | 12 | 24.4 | 36 | 5.8 |
| PA27Coma | 7 | 19.8 | 10 | 9.1 | 3 | 2.7 | 15 | 13.4 | 20 | 12.9 | 6 | 12.5 | 2 | 4.1 | 63 | 10.2 |
| PA27Doug | 0 | 0.0 | 1 | 0.9 | 0 | 0.0 | 1 | 0.9 | 1 | 0.6 | 0 | 0.0 | 0 | 0.0 | 3 | 0.5 |
| PA28LowC | 3 | 8.5 | 0 | 0.0 | 8 | 7.3 | 10 | 8.9 | 16 | 10.3 | 1 | 2.1 | 6 | 12.2 | 44 | 7.1 |
| PA29Kiaw | 1 | 2.8 | 2 | 1.8 | 10 | 9.1 | 2 | 1.8 | 7 | 4.5 | 1 | 2.1 | 0 | 0.0 | 23 | 3.7 |
| PA294KI | 3 | 8.5 | 5 | 4.5 | 6 | 5.4 | 4 | 3.6 | 6 | 3.9 | 0 | 0.0 | 1 | 2.0 | 25 | 4.0 |
| PA30Ed60 | 4 | 11.3 | 5 | 4.5 | 15 | 13.6 | 19 | 17.0 | 18 | 11.6 | 3 | 6.3 | 4 | 8.1 | 68 | 11.0 |
| PA31Ed40 | 0 | 0.0 | 3 | 2.7 | 22 | 20.0 | 21 | 18.8 | 26 | 16.8 | 1 | 2.1 | 3 | 6.1 | 76 | 12.3 |
| PA32Edis | 2 | 5.6 | 5 | 4.5 | 1 | 0.9 | 3 | 2.7 | 39 | 25.2 | 4 | 8.4 | 4 | 8.1 | 58 | 9.4 |
| PA34CCA | 1 | 2.8 | 0 | 0.0 | 0 | 0.0 | 9 | 8.0 | 1 | 0.6 | 0 | 0.0 | 1 | 2.0 | 12 | 1.9 |
| PA34Jimm | 0 | 0.0 | 0 | 0.0 | 1 | 0.9 | 4 | 3.6 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 5 | 0.8 |
| PA36Edis | 0 | 0.0 | 0 | 0.0 | 3 | 2.7 | 9 | 8.0 | 46 | 29.7 | 1 | 2.1 | 3 | 6.1 | 62 | 10.0 |
| PA38Frip | 1 | 2.8 | 3 | 2.7 | 15 | 13.6 | 4 | 3.6 | 11 | 7.1 | 5 | 10.4 | 5 | 10.2 | 44 | 7.1 |

**Appendix 3.2**: Numbers of AR Trips and Numbers of Trips per 1,000 Anglers by AR Reef and Recall Month (Continue)

| Site Name | April | | May | | June | | July | | August | | September | | October | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PA39Hunt | 0 | 0.0 | 3 | 2.7 | 1 | 0.9 | 1 | 0.9 | 10 | 6.5 | 1 | 2.1 | 0 | 0.0 | 16 | 2.6 |
| PA40Hunt | 4 | 11.3 | 5 | 4.5 | 13 | 11.8 | 4 | 3.6 | 3 | 1.9 | 8 | 16.7 | 2 | 4.1 | 39 | 6.3 |
| PA406HI | 1 | 2.8 | 0 | 0.0 | 8 | 7.3 | 0 | 0.0 | 4 | 2.6 | 3 | 6.3 | 0 | 0.0 | 16 | 2.6 |
| PA41Gord | 1 | 2.8 | 8 | 7.3 | 11 | 10.0 | 13 | 11.6 | 7 | 4.5 | 4 | 8.4 | 3 | 6.1 | 47 | 7.6 |
| PA42Beau | 3 | 8.5 | 4 | 3.6 | 9 | 8.2 | 9 | 8.0 | 6 | 3.9 | 9 | 18.8 | 3 | 6.1 | 43 | 6.9 |
| PA43Parr | 5 | 14.1 | 12 | 10.9 | 6 | 5.4 | 14 | 12.5 | 21 | 13.5 | 5 | 10.4 | 2 | 4.1 | 65 | 10.5 |
| PA44Bets | 3 | 8.5 | 4 | 3.6 | 18 | 16.3 | 22 | 19.7 | 14 | 9.0 | 10 | 20.9 | 2 | 4.1 | 73 | 11.8 |
| PA45Fish | 1 | 2.8 | 3 | 2.7 | 6 | 5.4 | 5 | 4.5 | 2 | 1.3 | 0 | 0.0 | 10 | 20.4 | 27 | 4.4 |
| PA47Whit | 0 | 0.0 | 4 | 3.6 | 0 | 0.0 | 0 | 0.0 | 9 | 5.8 | 3 | 6.3 | 5 | 10.2 | 21 | 3.4 |
| PA48Eagl | 0 | 0.0 | 4 | 3.6 | 6 | 5.4 | 1 | 0.9 | 6 | 3.9 | 2 | 4.2 | 5 | 10.2 | 24 | 3.9 |
| PA49Hilt | 1 | 2.8 | 2 | 1.8 | 4 | 3.6 | 2 | 1.8 | 9 | 5.8 | 2 | 4.2 | 9 | 18.3 | 29 | 4.7 |
| PA49Tire | 0 | 0.0 | 5 | 4.5 | 1 | 0.9 | 4 | 3.6 | 11 | 7.1 | 0 | 0.0 | 4 | 8.1 | 25 | 4.0 |
| IS01Up | 6 | 16.9 | 7 | 6.4 | 14 | 12.7 | 9 | 8.0 | 13 | 8.4 | 11 | 23.0 | 10 | 20.4 | 70 | 11.3 |
| IS02Low | 6 | 16.9 | 7 | 6.4 | 11 | 10.0 | 8 | 7.1 | 8 | 5.2 | 15 | 31.3 | 5 | 10.2 | 60 | 9.7 |
| IS03StHe | 0 | 0.0 | 4 | 3.6 | 5 | 4.5 | 18 | 16.1 | 11 | 7.1 | 9 | 18.8 | 5 | 10.2 | 52 | 8.4 |
| IS04Ston | 1 | 2.8 | 1 | 0.9 | 3 | 2.7 | 8 | 7.1 | 14 | 9.0 | 3 | 6.3 | 12 | 24.4 | 42 | 6.8 |
| Total | 115 | 324.9 | 303 | 275.2 | 516 | 468.7 | 568 | 507.6 | 793 | 511.6 | 215 | 448.9 | 242 | 492.9 | 2752 | 444.2 |

**Appendix 3.3:** Numbers of Visitors and Numbers of Visitors per 1,000 Anglers by AR Reef and MRFSS Waves

| Site Name | Wave 3 | | Wave 4 | | Wave 5 | | Total | |
|---|---|---|---|---|---|---|---|---|
| PA01Jim | 8 | 3.6 | 31 | 11.6 | 6 | 6.2 | 45 | 7.7 |
| PA01Lit | 19 | 8.6 | 32 | 12.0 | 7 | 7.2 | 58 | 9.9 |
| PA02Off | 17 | 7.7 | 32 | 12.0 | 5 | 5.2 | 54 | 9.2 |
| PA02Bar | 2 | 0.9 | 1 | 0.4 | 0 | 0.0 | 3 | 0.5 |
| PA03Will | 3 | 1.4 | 4 | 1.5 | 2 | 2.1 | 9 | 1.5 |
| PA06BP | 10 | 4.5 | 14 | 5.2 | 4 | 4.1 | 28 | 4.8 |
| PA08Bill | 8 | 3.6 | 14 | 5.2 | 4 | 4.1 | 26 | 4.5 |
| PA09Para | 28 | 12.7 | 29 | 10.9 | 12 | 12.4 | 69 | 11.8 |
| PA09HP | 4 | 1.8 | 5 | 1.9 | 1 | 1.0 | 10 | 1.7 |
| PA09Grad | 3 | 1.4 | 6 | 2.2 | 0 | 0.0 | 9 | 1.5 |
| PA10TenM | 18 | 8.2 | 30 | 11.2 | 12 | 12.4 | 60 | 10.3 |
| PA10EleM | 4 | 1.8 | 10 | 3.7 | 2 | 2.1 | 16 | 2.7 |
| PA10Brue | 1 | 0.5 | 3 | 1.1 | 0 | 0.0 | 4 | 0.7 |
| PA11Paw | 14 | 6.4 | 14 | 5.2 | 9 | 9.3 | 37 | 6.3 |
| PA12Nor | 7 | 3.2 | 8 | 3.0 | 2 | 2.1 | 17 | 2.9 |
| PA13Way | 1 | 0.5 | 2 | 0.7 | 0 | 0.0 | 3 | 0.5 |
| PA14Geo | 12 | 5.4 | 17 | 6.4 | 9 | 9.3 | 38 | 6.5 |
| PA15Near | 16 | 7.3 | 25 | 9.4 | 9 | 9.3 | 50 | 8.6 |
| PA15Capt | 2 | 0.9 | 3 | 1.1 | 0 | 0.0 | 5 | 0.9 |
| PA16CJ | 6 | 2.7 | 3 | 1.1 | 0 | 0.0 | 9 | 1.5 |
| PA17Verm | 13 | 5.9 | 12 | 4.5 | 5 | 5.2 | 30 | 5.1 |
| PA18Gree | 8 | 3.6 | 6 | 2.2 | 1 | 1.0 | 15 | 2.6 |
| PA18Ralp | 1 | 0.5 | 1 | 0.4 | 0 | 0.0 | 2 | 0.3 |
| PA19Cape | 4 | 1.8 | 11 | 4.1 | 1 | 1.0 | 16 | 2.7 |
| PA20Hect | 6 | 2.7 | 4 | 1.5 | 0 | 0.0 | 10 | 1.7 |
| PA22Capr | 11 | 5.0 | 14 | 5.2 | 4 | 4.1 | 29 | 5.0 |
| PA22R8 | 10 | 4.5 | 6 | 2.2 | 1 | 1.0 | 17 | 2.9 |
| PA23Y73 | 7 | 3.2 | 15 | 5.6 | 4 | 4.1 | 26 | 4.5 |
| PA24C60 | 20 | 9.1 | 33 | 12.4 | 11 | 11.3 | 64 | 11.0 |
| PA25Near | 20 | 9.1 | 28 | 10.5 | 8 | 8.2 | 56 | 9.6 |
| PA25AirF | 2 | 0.9 | 2 | 0.7 | 0 | 0.0 | 4 | 0.7 |
| PA25Coas | 3 | 1.4 | 5 | 1.9 | 3 | 3.1 | 11 | 1.9 |
| PA25Comm | 1 | 0.5 | 2 | 0.7 | 0 | 0.0 | 3 | 0.5 |
| PA26Foly | 3 | 1.4 | 6 | 2.2 | 4 | 4.1 | 13 | 2.2 |
| PA27Coma | 10 | 4.5 | 19 | 7.1 | 7 | 7.2 | 36 | 6.2 |
| PA27Doug | 1 | 0.5 | 2 | 0.7 | 0 | 0.0 | 3 | 0.5 |
| PA28LowC | 2 | 0.9 | 12 | 4.5 | 4 | 4.1 | 18 | 3.1 |
| PA29Kiaw | 8 | 3.6 | 6 | 2.2 | 1 | 1.0 | 15 | 2.6 |
| PA294KI | 7 | 3.2 | 6 | 2.2 | 1 | 1.0 | 14 | 2.4 |
| PA30Ed60 | 11 | 5.0 | 24 | 9.0 | 5 | 5.2 | 40 | 6.8 |
| PA31Ed40 | 14 | 6.4 | 25 | 9.4 | 3 | 3.1 | 42 | 7.2 |
| PA32Edis | 4 | 1.8 | 10 | 3.7 | 6 | 6.2 | 20 | 3.4 |
| PA34CCA | 0 | 0.0 | 3 | 1.1 | 1 | 1.0 | 4 | 0.7 |
| PA34Jimm | 1 | 0.5 | 1 | 0.4 | 0 | 0.0 | 2 | 0.3 |
| PA36Edis | 3 | 1.4 | 18 | 6.7 | 3 | 3.1 | 24 | 4.1 |

**Appendix 3.3:** Numbers of Visitors and Numbers of Visitors per 1,000 Anglers by AR Reef and MRFSS Waves (Continue)

| Site Name | Wave 3 | | Wave 4 | | Wave 5 | | Total | |
|---|---|---|---|---|---|---|---|---|
| PA38Frip | 6 | 2.7 | 9 | 3.4 | 6 | 6.2 | 21 | 3.6 |
| PA39Hunt | 2 | 0.9 | 7 | 2.6 | 1 | 1.0 | 10 | 1.7 |
| PA40Hunt | 6 | 2.7 | 5 | 1.9 | 6 | 6.2 | 17 | 2.9 |
| PA406HI | 2 | 0.9 | 2 | 0.7 | 1 | 1.0 | 5 | 0.9 |
| PA41Gord | 9 | 4.1 | 14 | 5.2 | 6 | 6.2 | 29 | 5.0 |
| PA42Beau | 8 | 3.6 | 10 | 3.7 | 6 | 6.2 | 24 | 4.1 |
| PA43Parr | 10 | 4.5 | 19 | 7.1 | 2 | 2.1 | 31 | 5.3 |
| PA44Bets | 11 | 5.0 | 19 | 7.1 | 9 | 9.3 | 39 | 6.7 |
| PA45Fish | 5 | 2.3 | 5 | 1.9 | 3 | 3.1 | 13 | 2.2 |
| PA47Whit | 3 | 1.4 | 7 | 2.6 | 4 | 4.1 | 14 | 2.4 |
| PA48Eagl | 5 | 2.3 | 6 | 2.2 | 5 | 5.2 | 16 | 2.7 |
| PA49Hilt | 3 | 1.4 | 10 | 3.7 | 7 | 7.2 | 20 | 3.4 |
| PA49Tire | 3 | 1.4 | 9 | 3.4 | 1 | 1.0 | 13 | 2.2 |
| IS01Up | 14 | 6.4 | 10 | 3.7 | 10 | 10.3 | 34 | 5.8 |
| IS02Low | 10 | 4.5 | 9 | 3.4 | 7 | 7.2 | 26 | 4.5 |
| IS03StHe | 6 | 2.7 | 19 | 7.1 | 5 | 5.2 | 30 | 5.1 |
| IS04Ston | 4 | 1.8 | 9 | 3.4 | 5 | 5.2 | 18 | 3.1 |
| Total | 460 | 208.9 | 723 | 270.9 | 241 | 248.5 | 1424 | 243.8 |

**Fig. A3.1 Angler Trips Involving Permitted Areas (e.g. Large Circles Represent More Trips).**

**Fig. A3.2.** Number of Fishing Trip Visits Per 1,000 Anglers to AR Permitted Areas of the North AR Cluster during 2006.

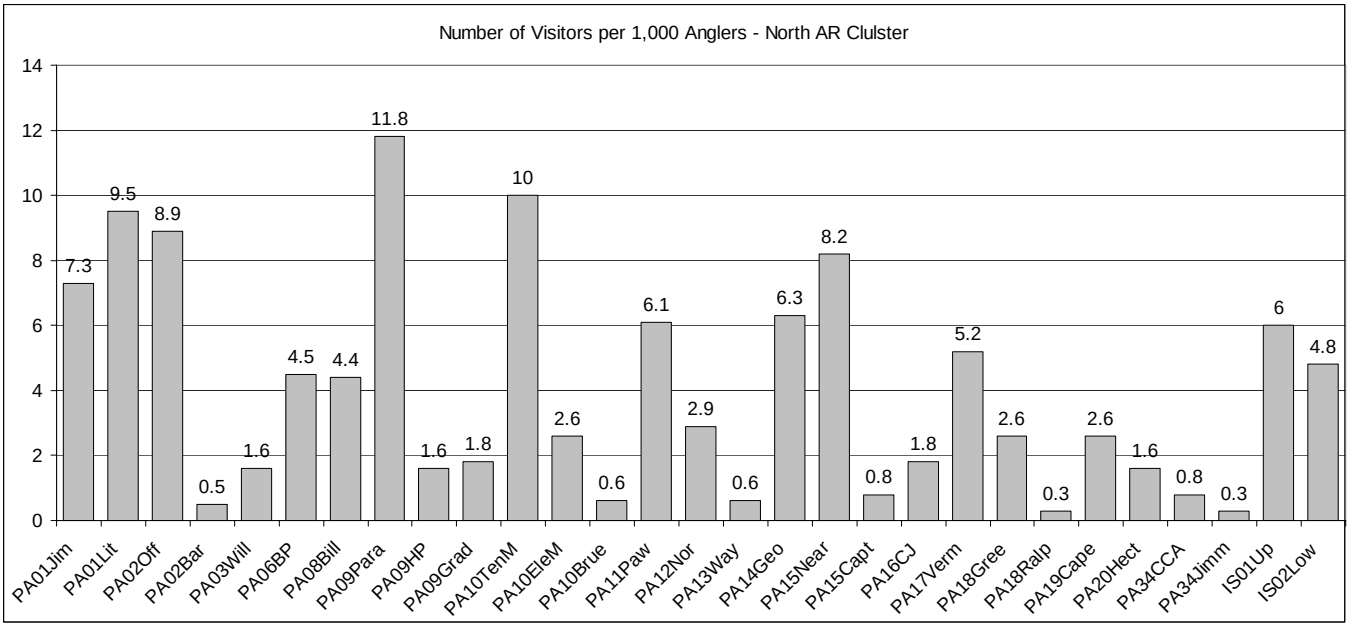


**Fig. A3.3.** Number of Fishing Trip Visits Per 1,000 Anglers to AR Permitted Areas of the Central AR Cluster during 2006.

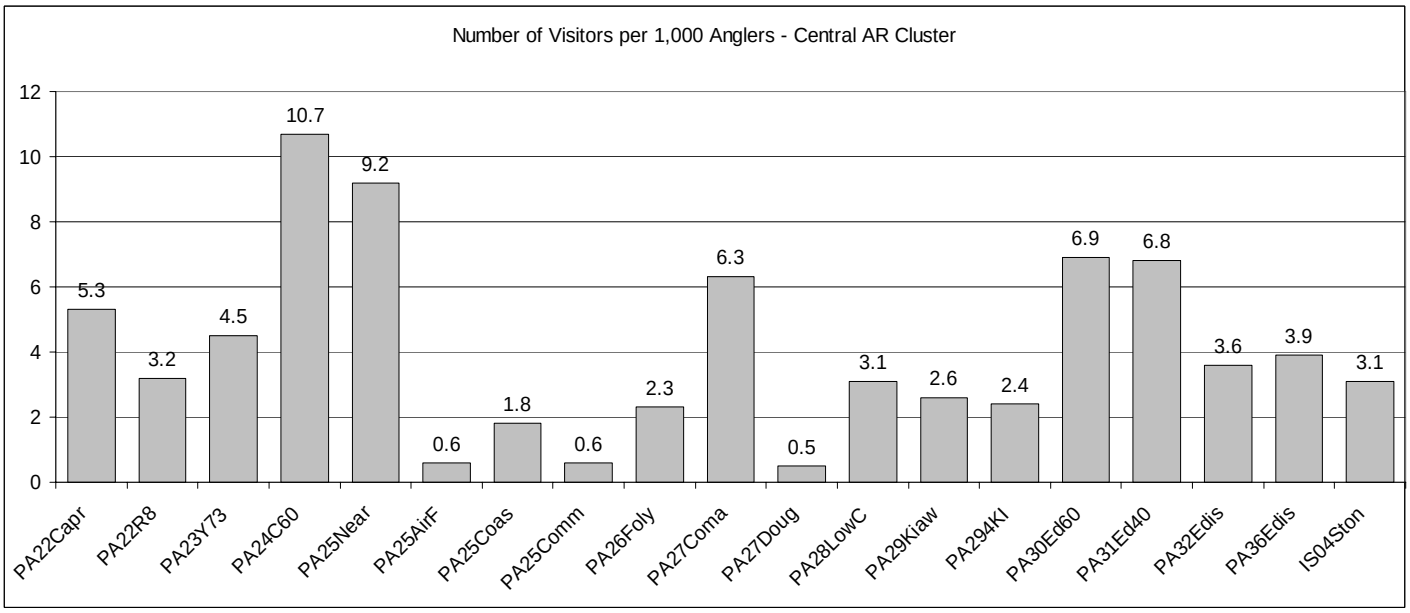
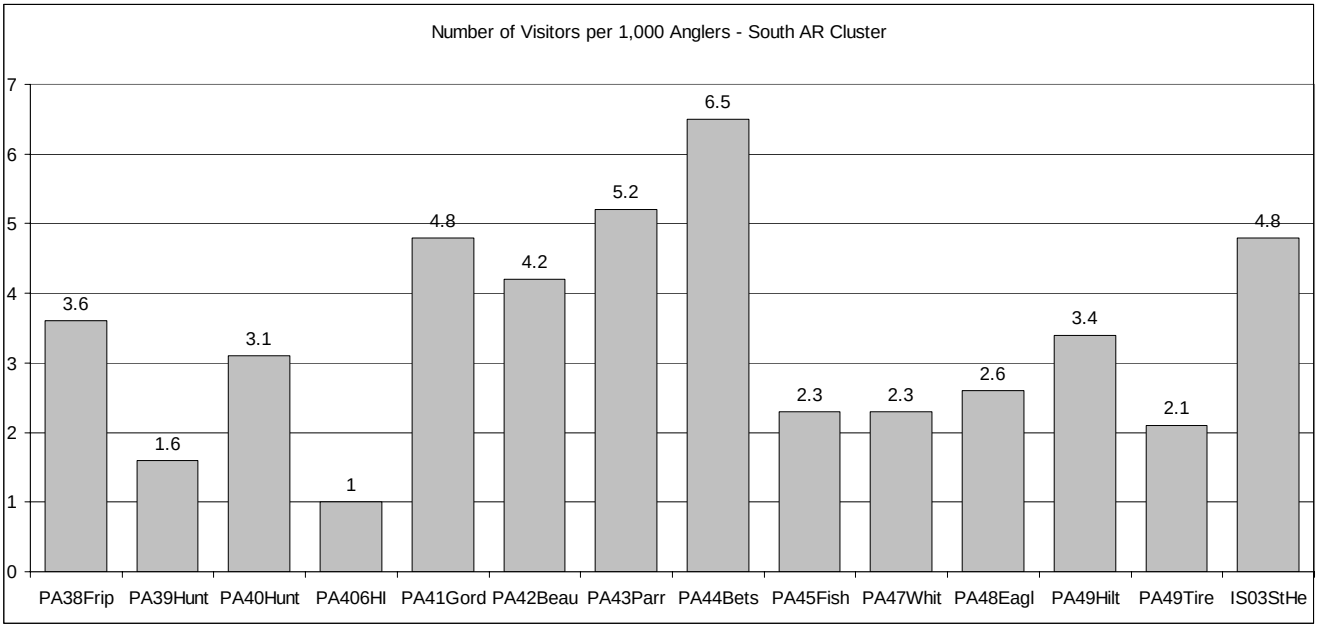
**Fig. A3.4.** Number of Fishing Trip Visits Per 1,000 Anglers to AR Permitted Areas of the South AR Cluster during 2006.